AUTHORITY: Act 431 of 1984
COMPLETION: Required
PENALTY: Contract will not be executed unless form is filed

STATE OF MICHIGAN
DEPARTMENT OF MANAGEMENT AND BUDGET
PURCHASING OPERATIONS
P.O. BOX 30026, LANSING, MI 48909
OR
530 W. ALLEGAN, LANSING, MI 48933

January 13, 2010

CHANGE NOTICE NO. 1
TO
CONTRACT NO. 071B9200172
between
THE STATE OF MICHIGAN
And

Fax: 513-752-4992

NAME & ADDRESS OF CONTRACTOR **Shepard Bros, Inc.** **20 Eastern Blvd.** **Canandaigua, NY 14424** **Email: jadams04@fuse.net**	TELEPHONE 513- 752-1311 **Jim Adams** CONTRACTOR NUMBER/MAIL CODE BUYER/CA (517) 373-1455 **Laura Gyorkos, CPPB**
Contract Compliance Inspector: Michael Frezell (517) 335-0904 **Small (cutaway), 18-Passenger Buses for Transit Authorities**	
CONTRACT PERIOD: **2 yrs. + 1 one-year option** From: **March 10, 2009** To: **March 9, 2011**	
TERMS **Net 30**	SHIPMENT **210 Days ARO**
F.O.B. **F.O.B. Delivered**	SHIPPED FROM **Penn Yan, NY**
MINIMUM DELIVERY REQUIREMENTS **None**	
MISCELLANEOUS INFORMATION:	

THIS CONTRACT IS EXTENDED TO LOCAL UNITS OF GOVERNMENT AND PUBLIC TRANSIT AGENCIES.

NATURE OF CHANGE (S):

The Cost Model has been revised to reflect the following changes:

1. **Removal of the supplemental hazard switch - $30.00 (per bus)**
2. **Removal of the thicker window glass - $50.00 (per bus)**

Please refer to the attached cost model for the revised cost.

AUTHORITY/REASON:
Per DMB/Purchasing Operations and MDOT (Michael Frezell).

ESTIMATED CONTRACT VALUE REMAINS: $7,132,952.61

071B9200172
APPENDIX A
COST MODEL
Updated 12/31/2009

MICHIGAN SMALL BUS SPECIFICATION
5 Years/150,000 Miles
18 Passenger Nonlift Bus – Lift Bus With Alternate Seating

Body Manufacturer: Coach & Equipment Manufacturing Corp.
Vendor Name: Shepard Bros., Inc.
Vendor Address: Midwest Office: 942 Surrey Way, Cincinnati, Ohio 45245
Corporate Office: 20 Eastern Blvd., Canandaigua, NY 14424

I. COST MODEL

Quantity			Unit Price	Total
	Passenger seats with vinyl seat covers			
16 Ea	A.	18 passenger bus without lift	**$ 43,694.71**	$ 699,115.36
38 Ea	B.	11+1 passenger bus with front passive lift	**$ 47,198.67**	$ 1,793,549.46
18 Ea	C.	8+2 passenger bus with front passive lift	**$ 46,997.53**	$ 845,955.54
8 Ea	D.	4+2 passenger bus with rear passive lift	**$ 48,512.39**	$ 388,099.12
	Passenger seats with fabric seat covers			
9 Ea	E.	18 passenger bus without lift	**$43,940.68**	$ 395,466.12
21 Ea	F.	11+1 passenger bus with front passive lift	**$47,405.22**	$ 995,509.62
10 Ea	G.	8+2 passenger bus with front passive lift	**$47,163.80**	$ 471,638.00
5 Ea	H.	4+2 passenger bus with rear passive lift	**$48,731.79**	$ 243,658.95
	Options – Alternate Quote Prices			
60 Ea	1a.	Air Conditioning System skirt mount	$5,808.15	$348,488.70
55 Ea	1b.	Air Conditioning System roof mount	$6,594.87	$362,717.91
60 Ea	2.	Manual entrance door (deduct)	$ (633.88)	$ (38,032.80)
60 Ea	3.	Diesel engine 6.0ℓ, minimum	$7,735.12	$464,106.96
30 Ea	4a.	Auxiliary air heater system-gas	$2,239.64	$ 67,189.05
10 Ea	4b.	Auxiliary air heater system-diesel	$2,239.64	$ 22,396.35
15 Ea	5.	Power seat base for driver's seat	$ 374.00	$ 5,610.00
5 Ea	6.	Destination Sign	$ 3,030.94	$ 15,154.70
5 Ea	7.	Ceiling Handrails	$ 327.96	$ 1,639.80
~~* 60 Ea~~	~~8.~~	~~Engine shutdown system~~	~~$ 84.99~~	~~$ 5,099.40~~
25 Ea	9.	Donation box	$ (650.02)	$ (16,250.55)
25 Ea	10.	Farebox Electrical Prep	$ 31.43	$ 785.63
25 Ea	11.	Rear emergency exit window	$ (450.34)	$ (11,258.50)
10 Ea	12a.	Paint - One stripe	$ 310.24	$ 3,102.40
10 Ea	12b.	Paint - Roof second color	$ 603.21	$ 6,032.12
10 Ea	12c.	Paint - Different Full body	$2,321.64	$ 23,216.40
20 Ea	13.	Folding Platform Passive Lift	$ 233.88	$ 4,677.54
25 Ea	14.	Rear five place passenger seat	$ 321.04	$ 8,025.93
20 Ea	15.	Two-way radio prep package	$ 208.69	$ 4,173.80
25 Ea	16.	Smooth Anti-slip Flooring	$ 455.66	$ 11,391.50
10 Ea	17.	Entrance Stepwell heater	$ 169.41	$ 1,694.10

TOTAL EVALUATION PRICE OF A, B, C, D, E, F, G, H, I, J, AND K ABOVE $6,769,364.51

*Engine shutdown system no longer available.

AUTHORITY: Act 431 of 1984
COMPLETION: Required
PENALTY: Contract will not be executed unless form is filed

STATE OF MICHIGAN
DEPARTMENT OF MANAGEMENT AND BUDGET
PURCHASING OPERATIONS
P.O. BOX 30026, LANSING, MI 48909
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530 W. ALLEGAN, LANSING, MI 48933

March 13, 2009

NOTICE
OF
CONTRACT NO. 071B9200172
between
THE STATE OF MICHIGAN
And

Fax: 513-752-4992

NAME & ADDRESS OF CONTRACTOR **Shepard Bros, Inc.** **20 Eastern Blvd.** **Canandaigua, NY 14424** **Email: jadams04@fuse.net**	TELEPHONE 513- 752-1311 **Jim Adams** CONTRACTOR NUMBER/MAIL CODE BUYER/CA (517) 373-1455 **Laura Gyorkos, CPPB**
Contract Compliance Inspector: Michael Frezell (517) 335-0904 **Small (cutaway), 18-Passenger Buses for Transit Authorities**	
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TERMS **Net 30**	SHIPMENT **210 Days ARO**
F.O.B. **F.O.B. Delivered**	SHIPPED FROM **Penn Yan, NY**
MINIMUM DELIVERY REQUIREMENTS **None**	
MISCELLANEOUS INFORMATION:	

THIS CONTRACT IS EXTENDED TO LOCAL UNITS OF GOVERNMENT AND PUBLIC TRANSIT AGENCIES.

The terms and conditions of this Contract are those of ITB #071I9200053, this Contract Agreement and the vendor's quote dated January 15, 2009. In the event of any conflicts between the specifications, and terms and conditions, indicated by the State and those indicated by the vendor, those of the State take precedence.

Estimated Contract Value: $7,132,952.61

AUTHORITY: Act 431 of 1984
COMPLETION: Required
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TERMS	SHIPMENT
Net 30	**210 Days ARO**
F.O.B.	SHIPPED FROM
F.O.B. Delivered	**Penn Yan, NY**

MINIMUM DELIVERY REQUIREMENTS
None

MISCELLANEOUS INFORMATION:

THIS CONTRACT IS EXTENDED TO LOCAL UNITS OF GOVERNMENT AND PUBLIC TRANSIT AGENCIES.

The terms and conditions of this Contract are those of ITB #071I9200053, this Contract Agreement and the vendor's quote dated January 15, 2009. In the event of any conflicts between the specifications, and terms and conditions, indicated by the State and those indicated by the vendor, those of the State take precedence.

Estimated Contract Value: $7,132,952.61

THIS IS NOT AN ORDER: This Contract Agreement is awarded on the basis of our inquiry bearing the ITB No. 071I9200053. Orders for delivery will be issued directly by various authorized Local Units of Government and Public Transit Agencies through the issuance of a Purchase Order Form.

All terms and conditions of the invitation to bid are made a part hereof.

FOR THE CONTRACTOR:	**FOR THE STATE:**
Shepard Bros., Inc. Firm Name	Signature
Authorized Agent Signature	**Anthony DesChenes, Director** Name/Title
Authorized Agent (Print or Type)	**Commodities Division, Purchasing Operations** Division
Date	Date

STATE OF MICHIGAN
Department of Management and Budget
Purchasing Operations

Contract No. **071B9200172**
Small (cutaway), 18-Passenger Buses

Shepard Bros, Inc.

Buyer Name: **Laura Gyorkos**
Telephone Number: **517-373-1455**
E-Mail Address: **gyorkosL@michigan.gov**

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DEFINITIONS

"Days" means calendar days unless otherwise specified.

"24x7x365" means 24 hours a day, seven days a week, and 365 days a year (including the 366th day in a leap year).

"Additional Service" means any Services/Deliverables within the scope of the Contract, but not specifically provided under any Statement of Work, that once added will result in the need to provide the Contractor with additional consideration.

"Audit Period" has the meaning given in **Section 2.093.**

"Business Day," whether capitalized or not, shall mean any day other than a Saturday, Sunday or State-recognized legal holiday (as identified in the Collective Bargaining Agreement for State employees) from 8:00am EST through 5:00pm EST unless otherwise stated.

"Blanket Purchase Order" is an alternate term for Contract and is used in the States computer system.

"Business Critical" means any function identified in any Statement of Work as Business Critical.

"Chronic Failure" is defined in any applicable Service Level Agreements.

"Deleted – Not Applicable" means that section is not applicable or included in this CONTRACT. This is used as a placeholder to maintain consistent numbering.

"Deliverable" means physical goods and/or commodities as required or identified by a Statement of Work

"DMB" means the Michigan Department of Management and Budget

"Environmentally preferable products" means a product or service that has a lesser or reduced effect on human health and the environment when compared with competing products or services that serve the same purpose. Such products or services may include, but are not limited to, those which contain recycled content, minimize waste, conserve energy or water, and reduce the amount of toxics either disposed of or consumed.

"Excusable Failure" has the meaning given in **Section 2.214.**

"Hazardous material" means any material defined as hazardous under the latest version of federal Emergency Planning and Community Right-to-Know Act of 1986 (including revisions adopted during the term of the Contract).

"Incident" means any interruption in Services.

"ITB" is a generic term used to describe an Invitation to Bid. The ITB serves as the document for transmitting the RFP to potential bidders

"Key Personnel" means any Personnel designated in **Section 1.031** as Key Personnel.

"New Work" means any Services/Deliverables outside the scope of the Contract and not specifically provided under any Statement of Work, that once added will result in the need to provide the Contractor with additional consideration.

"Ozone-depleting substance" means any substance the Environmental Protection Agency designates in 40 CFR part 82 as: (1) Class I, including, but not limited to, chlorofluorocarbons, halons, carbon tetrachloride, and methyl chloroform; or (2) Class II, including, but not limited to, hydrochlorofluorocarbons.

“Post-Consumer Waste” means any product generated by a business or consumer which has served its intended end use, and which has been separated or diverted from solid waste for the purpose of recycling into a usable commodity or product, and which does not include post-industrial waste.

“Post-Industrial Waste” means industrial by-products which would otherwise go to disposal and wastes generated after completion of a manufacturing process, but does not include internally generated scrap commonly returned to industrial or manufacturing processes.

“Recycling” means the series of activities by which materials that are no longer useful to the generator are collected, sorted, processed, and converted into raw materials and used in the production of new products. This definition excludes the use of these materials as a fuel substitute or for energy production.

“Reuse” means using a product or component of municipal solid waste in its original form more than once.

“RFP” means a Request for Proposal designed to solicit proposals for services.

“Services” means any function performed for the benefit of the State.

“Source reduction” means any practice that reduces the amount of any hazardous substance, pollutant, or contaminant entering any waste stream or otherwise released into the environment prior to recycling, energy recovery, treatment, or disposal.

“State Location” means any physical location where the State performs work. State Location may include state-owned, leased, or rented space.

“Subcontractor” means a company Contractor delegates performance of a portion of the Services to, but does not include independent contractors engaged by Contractor solely in a staff augmentation role.

“Unauthorized Removal” means the Contractor’s removal of Key Personnel without the prior written consent of the State.

“Waste prevention” means source reduction and reuse, but not recycling.

“Waste reduction”, or “pollution prevention” means the practice of minimizing the generation of waste at the source and, when wastes cannot be prevented, utilizing environmentally sound on-site or off-site reuse and recycling. The term includes equipment or technology modifications, process or procedure modifications, product reformulation or redesign, and raw material substitutions. Waste treatment, control, management, and disposal are not considered pollution prevention, per the definitions under Part 143, Waste Minimization, of the Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451, as amended.

“Work in Progress” means a Deliverable that has been partially prepared, but has not been presented to the State for Approval.
“Work Product” refers to any data compilations, reports, and other media, materials, or other objects or works of authorship created or produced by the Contractor as a result of an in furtherance of performing the services required by this Contract.

Article 1 – Statement of Work (SOW)

1.010 Project Identification

1.011 Project Request

This is a contract for the Michigan Department of Transportation, Bureau of Passenger Transportation for 18-passenger buses with various floor plans.

1.012 Background

This contract is for the purchase of small buses by Authorized Local Units of Government and Public Transit Agencies to be used in the provision of public transportation services throughout the State of Michigan.

1.020 Scope of Work and Deliverables

1.21 In Scope

This contract is for small, 18-passenger buses with various floor plans. Exact quantities to be purchased are unknown; however, as the Contractor, you will be required to furnish all such materials and services as may be ordered during the contract period. Quantities specified if any, are estimates based on prior purchases, and the State is not obligated to purchase in these quantities. Orders for delivery will be issued directly to the Contractor by various authorized Local Units of Government and Public Transit Agencies.

Appendix D is a listing of these agencies which are authorized to order from this contract. The listing shall not limit participation of additional agencies/locations as the need may develop at the same prices, terms and conditions. However, written approval for additional agencies/location not on the attached list must be received by the Contractor from the Michigan Department of Transportation.

Shepard Bros. is prepared to provide any quantity of buses specified in the six floor plans in these specifications as well as in variations/option choices approved by MDOT and that may be requested by any of the agencies identified in Appendix D or other agencies approved by the State of Michigan. Shepard Bros.' manufacturer has plenty of excess production capacity. Further, Shepard Bros. offers buses that conform to the specifications.

1.030 Roles and Responsibilities

1.031 Contractor Staff, Roles, and Responsibilities

CUSTOMER SERVICE/ORDERING
The contractor shall have the capacity to receive orders via fax, mail, or e-mail. If mailed, a purchase order is considered "issued" when the order is placed in the mail. Contractors shall have internal controls, approved by Purchasing Operations, to insure that authorized individuals with the State place orders. The contractor shall verify orders that have quantities that appear to be abnormal or excessive.

When an order is placed by an agency, the contractor will compare the new order to the most recent previous order and provide the Michigan Department of Transportation, Bureau of Passenger Transportation and the customer a report of any differences to verify. All orders will receive an "Acknowledgement" for final approval to start to build.

It is the preference of the State of Michigan that the Contractor have an accessible customer service department with an individual specifically assigned to State of Michigan accounts. It is the preference of the State of Michigan that the Contractor shall have experienced sales representatives make timely

personal visits to State accounts. The Contractor's customer service must respond to State agency inquiries promptly. It is the preference of the State of Michigan that the Contractor provides a statewide toll-free number for customer service calls.

Any supplies and services to be furnished under this contract shall be ordered by issuance of a purchase order, unless otherwise defined within the contract. Orders for delivery will be issued directly to the Contractor by various authorized Local Units of Government and Public Transit Agencies.

All purchase orders are subject to the terms and conditions of this contract. In the event of a conflict between a purchase order and the contract, the contract shall control.

Shepard Bros. will provide the same customer service and ordering capabilities and procedures that were followed during the previous contract with the State of Michigan assuming these were satisfactory to the State. Shepard Bros is willing to make reasonable adjustments or changes should MDOT wish to enhance or modify these services and procedures. The factory's toll free number is 800-724-8464.

1.040 Project Plan

1.041 Project Plan Management

The contractor will carry out this project under the direction and control of the Michigan Department of Transportation (MDOT), Bureau of Passenger Transportation; authorized local units of government; and public transit agencies.

Although there will be continuous liaison with the contractor team, the client agency's project director will meet monthly as a minimum, with the contractor's project manager for the purpose of reviewing progress and providing necessary guidance to the contractor in solving problems that arise.

The contractor will submit brief written quarterly summaries of progress which outline the work accomplished during the reporting period; work to be accomplished during the subsequent reporting period; problems, real and anticipated, which should be brought to the attention of the client agency' project manager; and notification of any significant deviation from previously agreed upon work plans. A copy of this report will be forwarded to the named buyer in Purchasing Operations.

Within thirty (30) working days of the award the contract, the contractor will submit to the Michigan Department of Transportation, Bureau of Passenger Transportation project manager for final approval a work plan, which must include the following:

- The contractor's project organizational structure.
- The contractor's staffing table with names and title of personnel assigned to the project. This must be in agreement with staffing of accepted proposals. Necessary substitutions due to change of employment status and other unforeseen circumstances may only be made with prior approval of the State.
- The project breakdown showing sub-projects, activities and tasks, and resources required and allocated to each.
- The time-phased plan, in the form of a graphic display, showing each event, task, and decision point in your work plan.

Shepard Bros. agrees to comply with the requirements of this Section 1.041 Project Plan Management. Jim Adams will be the project manager and he will comply with the work plan, meeting and reporting requirements of this section.

1.042 Reports

The Contractor shall be able to provide various reports, when requested. Examples include itemized report of total items (commodities and services) purchased by all agencies or individual agencies, open invoice reports, delivery compliance reports, services compliance reports etc.

For Contracts that are available for purchases by MiDEAL program members (authorized local units of government), the contractor must submit reports of purchasing activities to Purchasing Operations, DMB on a quarterly basis. Reports shall include, at a minimum, an itemized listing of purchasing activities by each agency, with the agency name, and the total value of purchases for each agency, and a grand total of all purchases.

Shepard Bros. agrees to the reporting requirements of this section to provide various reports; including itemized reports of total items purchased by all agencies or individual agencies, open invoice reports, delivery compliance reports service compliance reports and any other specialized reports that may be required by the State of Michigan. Shepard Bros. will also provide products to, and comply with reporting requirements for, those agencies eligible for government pricing concessions in the MiDEAL program.

1.050 Acceptance

1.051 Criteria

The following criteria will be used by the State to determine Acceptance of the Services or Deliverables provided under this SOW:

PRODUCTION SCHEDULE
For the delivery of all units that may be released against the contract the following shall apply:

Pre-Pilot Model Review Meeting at the Manufacture Facility, or at a mutually agreed upon location, shall be conducted within thirty (30) calendar days from the date of the Purchase Order/Contract Release Form.

Delivery of Chassis to the Body Contractor, after the Pre-Pilot Model Meeting, shall be within one hundred (120) days.

Pilot Model Inspection Meeting at the Contractors Facility, or a mutually agreed upon location, shall be within sixty (60) calendar days, after the delivery of the Chassis to the Body Contractor.

Pilot Model Inspections and Approvals, shall be completed by the State and/or receiving agency within thirty (30) calendar days after delivery of the pilot model by the ordering agency.

Exact Delivery Due Dates, will be determined by the delivery schedule, plus (+) seven (7) calendar days from issue dated indicated on the Purchase Order/Contract Release Form. Delivery shall be at the rate of one (1) unit per week minimum until completion of the Purchase Order/Contract Release Form.

BUS OPERATING INSTRUCTIONS
Instructions, either graphic or audio-visual (DVD), for operating the bus shall be included with the first bus delivered to each agency. The instructions shall clearly identify the controls, switches, gauges, and other instructions that bus drivers and/or operators use while the bus would be in service. Instructions shall also be included for the operation of the Lift Interlock System, entrance door, and vehicle engine compartment fluid level fill and check areas.

PRE-DELIVERY SERVICE AND CONDITIONS
Prior to delivery, each bus shall be serviced and inspected by the dealer or his agent. At a minimum, this pre-delivery service shall cover the specifications listed in the Michigan Department of Transportation Specifications. A copy of the contractor's inspection and service check, including the contractors and vehicle identification, check off of service and inspection performed and service manager's signature shall be furnished with each bus delivered. The bus's crank case, differential and transmission shall be filled to the manufacture's recommended capacity and fuel tank shall have a minimum of one-half of a tank of fuel when the bus arrives at the delivery destination. The bus shall be clean and free from defects when delivered.

Each unit shall have an initial fill of windshield washer solution with solvent giving winter protection.

The receiving departments and/or agencies have been instructed to make immediate inspection on receipt of units and to process payment documents promptly. Payment documents; however, will be delayed if the bus fails to comply with specification requirements. Therefore, we wish to impress on contract dealers that close pre-delivery inspection in accordance with specifications be made.

Shepard Bros., Inc. agrees to the production schedule listed above and agrees to accelerate the program during certain task[s] if necessary. Shepard Bros. will comply with the provisions and requirements of Section 1.051 Criteria.

1.052 Final Acceptance

Final Acceptance is when the project is completed and functions according to the requirements listed above. Any intermediate acceptance of sub-Deliverables does not complete the requirement of Final Acceptance.

The Michigan Department of Transportation (MDOT), Bureau of Passenger Transportation; authorized local units of government; and public transit agencies has the right to refuse bus delivery when the conditions listed above are not met.

1.060 Proposal Pricing

1.061 Proposal Pricing

All pricing information is included in Appendix A.

Contractor's out-of-pocket expenses are not separately reimbursable by the State unless, on a case-by-case basis for unusual expenses, the State has agreed in advance and in writing to reimburse Contractor for an expense at the State's current travel reimbursement rates. See **www.michigan.gov/dmb** for current rates.

1.062 Price Term

Agency to choose one of the following:

(X) Firm Fixed Price

Prices quoted are firm for the entire length of the Contract.

Prices are the maximum to be charged for the contract period with the following exceptions. The State, and other agencies, shall receive the benefit of any decreases in the cost incurred by the Contractor. If changes in the chassis manufacturers OEM standard equipment affect the cost of the buses required during the contract period by more then one hundred dollars ($100.00), the prime contractor may request a price revision to reflect the actual cost experienced. The request for a cost increase must be accompanied by

evidence from the chassis manufacturer that a change actually affected the prime contractor's cost. Additionally, it shall be the prime contractor's responsibility to inform the Michigan Department of Transportation, Bureau of Passenger Transportation; authorized local units of government; public transit agencies; and Purchasing Operations in notify of its qualification for price reductions.

If changes in federal regulations affect the cost of the buses required during the contract period by more than one hundred dollars ($100.00), the prime contractor may request a price revision to reflect the actual cost increase experienced. The request must accompanied by evidence that the change actually affected the prime contractor's cost.

Requests for price changes shall be received in writing at least 30 days prior to their effective date, and are subject to written acceptance before becoming effective. In the event new prices are not acceptable, the contract may be cancelled. The continued payment of any charges due after September 30th of any fiscal year will be subject to the availability of an appropriation for this purpose.

1.063 Title Fees

Prices include the cost of the title fees for each bus.

The **Title To** information for all orders will be as follows:
NAME OF AUTHORIZED LOCAL UNITS OF GOVERNMENT AND/OR PUBLIC TRANSIT AGENCY

Authorized local units of government and public transit agencies will be responsible to notify the contractor to designate the State of Michigan Department of Transportation, Bureau of Passenger Transportation, 425 W. Ottawa, Lansing, Michigan, 48909, as "First Secured Party" on titles of all vehicles purchased locally with state administered grants.

If the State of Michigan modifies the cost of vehicle titles during the contract period, either the state or the contractor may request of price adjustment to reflect the actual change.

1.064 Tax Excluded from Price

(a) Sales Tax: For purchases made directly by the State, the State is exempt from State and Local Sales Tax. Prices must not include the taxes. Exemption Certificates for State Sales Tax will be furnished upon request.

(b) Federal Excise Tax: The State may be exempt from Federal Excise Tax, or the taxes may be reimbursable, if articles purchased under any resulting Contract are used for the State's exclusive use. Certificates showing exclusive use for the purposes of substantiating a tax-free, or tax-reimbursable sale will be sent upon request. If a sale is tax exempt or tax reimbursable under the Internal Revenue Code, prices must not include the Federal Excise Tax.

1.070 Commodity Requirements and Terms

Product Quality

1.0701 Specifications

Definite Specifications - All buses and/or services to be furnished hereunder shall conform to the specifications as noted in the specifications attached.

Shepard Bros. agrees to the requirements of this section.

1.0702 Alternate Bids – Deleted – Not Applicable

1.0703 Research and Development

Shepard Bros. participates in many industry associations, such as MSMBA, to better understand their competition and to keep abreast of the latest developments. In addition Shepard Bros. is fully involved in the testing and evaluation process of new products presented by their suppliers. The Engineering Department is constantly evaluating and testing these products.

1.0704 Quality Assurance Program

Coach & Equipment is in the later stages of ISO certification. Shepard Bros. achieved nearly a perfect score in the Ford QVM audit report.

1.0705 Warranty for Products or Services

The contractor shall include the warranty associated with the actual product being proposed, as well as the warranty associated with any service work performed under the contract.

The prime contractor will be responsible for all materials and accessories used in the buses, whether the same is ready made or from an outside source; and this responsibility may not be transferred, conveyed, assigned to any other person, company, corporation or entity without the previous written approval of the State.

Extension of warranty and or other policy adjustments will be considered when constant maintenance is required or if replacement parts prove unsound. The State of Michigan shall expect the manufacturer to have adequate stock of replacement parts available to service State buses and to make delivery of all replacement parts to their dealers who may service State buses. The prime contractor will be required to contact the Michigan Department of Transportation, Bureau of Passenger Transportation; authorized local units of government; and public transit agencies within ten (10) after receipt of contract to arrange procedures concerning the implementation of warranty claims and to designate personnel to handle claims.

The State further expects that warranty service and repairs as well as non-warranty service and repairs will be handled without prejudice

Shepard Bros. agrees with the warranty requirements of this section. Shepard Bros., Inc./Coach & Equipment, in compliance with the Michigan specification, commits to a 3-year warranty on the body structure, exterior and paint (excepting damage from collision, stones, abuse by the customer, or other unusual items not the fault of Coach & Equipment). Shepard Bros. further offers an additional two [2] years on body structural failure with the same limitations. After all a five [5] year bus should last that long. Note that our Phoenix model was tested at the more rigorous 7-year 200,000 mile Altoona Test, while most of our competitors only meet the minimum five [5] year testing requirements for this class of bus. The wheelchair lift and air conditioning systems have limited warranties for 5 years and 2 years by the lift and air conditioning manufacturers, respectively. Ford offers their standard chassis warranties. Shepard Bros. also agrees to Michigan question responses regarding the Coach & Equipment electrical design to match the RC Tronics warranty.

1.0706 Training

The Contractor shall provide training to individual agencies, when necessary, on aspects of ordering, shipping, billing, and receiving. At the request of the Contract Administrator, the Contractor shall provide in-service training to agency personnel on products, installation, and product safety issues. The Contractor shall also provide agency training jointly with the Michigan Department of Transportation, Bureau of Passenger Transportation; local units of government; and local transit agencies as needed during the period covered by the contract at no additional charge.

When a bus is delivered to an agency, staff is given a brief overview of all the component features of the bus. Typically, the Shepard Bros. sales representative will visit the agency on the day of delivery or within a couple of days to ensure that the customer has an understanding of the vehicle operation and equipment. In some instances Shepard Bros. has returned to the agency, months after delivery, at their request, to give driver training to new drivers hired by the agency.

Shepard Bros., Inc./Coach & Equipment has and will continue to participate in the training sessions at the Higgins Lake Seminar. Should the State feel agency staff need training on a particular component or aspect of vehicle operation, Shepard Bros. will develop a training course in conjunction with MDOT. It is intent of Shepard Bros. to assist the State and any agency purchasing equipment to thoroughly understand how to operate and maintain the buses Shepard Bros. manufacture.

At the time of bus delivery Shepard Bros. will cover documentation and provide vehicle orientation, familiarization. The areas of instruction will include:

Administrative Training: An administrative review with office personnel on all vehicle documentation, warranty, and contractor contact information will be conducted. Shepard Bros will provide office personnel with all documentation, answering questions and teaching staff on how to use the documentation and who to contact for answers to questions.

Operator/Maintenance and Supervisory Personnel: In this module a vehicle orientation and operation for personnel will be provided. After the administrative review, the instructor will be available to answer questions and to provide a vehicle overview and orientation of the vehicle and its subsystems. Shepard Bros will also provide the training aids [i.e. DVD] specified in the Michigan specifications.

1.0707 Special Programs

Shepard Bros. is prepared to offer a number of special programs, as summarized below.

Training: Shepard Bros. offers training to customers' technical personnel by sponsoring two full day sessions, one on air conditioning system troubleshooting and repair, and the other on the use, maintenance and repair of wheelchair lifts. The sessions included a factory tour and lunch, with over 40 people attending. Shepard Bros. will also customize seminars for groups of customers at the factory or at a location central to Michigan customers.

Bus Configurations & Engineering
Shepard Bros. also has worked with customers to provide very specific engineering solutions. One customer that operated entirely within a retirement community needed the wheelchair lift on the left side of the bus. Another needed a single rear wheel bus with the lift out the back of the bus where the emergency door is typically located.

1.0708 Security

This Contract may require frequent deliveries to State of Michigan, local units of government and local transit agencies facilities. The contractor shall utilize measures to ensure the security and safety of these buildings. This shall include, but is not limited to, performance of security background checks on all personnel assigned to State of Michigan facilities (i.e. delivery people) and how they are performed, what the security check consists of, the name of the company that performs the security checks, use of uniforms and ID badges, etc. If security background checks are performed on staff, the contractor shall indicate the name of the company that performs the check as well as provide a document stating that each employee has satisfactorily completed a security check and is suitable for assignment to State facilities. Upon request by the State, the contractor shall provide the results of all security background checks.

Upon review of the security measures of the contractor, the State will decide whether to issue State ID badges to the contractor's delivery personnel or accept the ID badge issued to delivery personnel by the contractor.

The State may decide to also perform a security background check. If so, the contractor will be required to provide to the State a list of all delivery people that will service State of Michigan facilities, including name and date of birth (social security number of driver license number would also be helpful).

The Contractor and its subcontractors shall comply with the security access requirements of individual State facilities; see section 2.051, Background Checks and Security.

All new hirers undergo security background checks by Shepard Bros. Personnel Department during the hiring process. Shepard Bros. will provide employee information for employees assigned to work on this contract and that will report to a Michigan facility that may be requested by the State to verify security clearances. Shepard Bros., Inc. and Coach and Equipment shall comply with the security access requirements of individual State facilities.

1.0709 Delivery Capabilities

Time Frames

It is requested that all orders be delivered within two-hundred and ten (210) calendar days after receipt of order. The State is interested in both a standard delivery program and a quick-ship program.

Typically, MDOT can expect to see [over 80% of the time] buses delivered within 150 days or sooner from receipt of purchase order and we will commit to delivering buses within the 210 day MDOT requirement.

Quick Delivery: Shepard Bros. stands ready to accept quick delivery orders no less than twice a month of one [1 to 3] buses for each order that we will deliver within 120 days from receipt of purchase order providing that liquidated damages do not apply until after the 210th day [or if negotiated, 180 days.]

1.0710 Minimum Order

It is requested that the minimum order is one (1) bus.

1.0711 Packaging

Packaging and containers, etc., shall be in accordance with supplier's commercial practice and shall meet the requirements of Department of Transportation (D.O.T.) and rail and motor carrier freight classifications in effect at time of shipment, which will permit application of the lowest freight rate.

Shepard Bros., Inc. agrees to provide packaging and containers, etc., in accordance with supplier's commercial practice and shall meet the requirements of Department of Transportation (D.O.T.) and rail and motor carrier freight classifications in effect at time of shipment, which will permit application of the lowest freight rate.

1.0712 Palletizing- Deleted – Not Applicable

1.0713 Delivery Term

Prices shall be quoted "F.O.B. Delivered" with transportation charges prepaid on all orders of (1) one or more to the State.

DRIVER DELIVERY
Contractors will be permitted to drive buses to final destinations in compliance with the "Affidavit for Driver Delivery" attached, however, the affidavit must be completed, submitted, and in the contract file within Purchasing Operations to be applicable.

Delivery must be made between the hours of 8:00 a.m. and 4:00 p.m., Monday through Friday ONLY, Excluding Holidays.

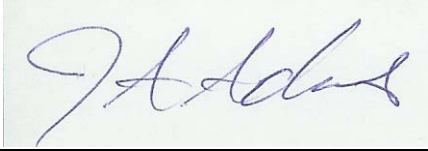
1.0714 Affidavit for Driver Delivery

Buses may be driven to the final delivery destination if the following conditions are met:

1. The drivers of the buses are correctly licensed and trained in proper vehicle operation.
2. The dealership accepts all responsibility and liability for buses in transit.
3. The contractor must sign the affidavit below.

The contractor accepts all responsibility and liability for buses in transit and guarantees the buses shall be transported in a safe, proper, and efficient manner.

I understand that the State may cancel approval of this affidavit at any time during the contract if the contractor fails to meet the above obligations.



_____ 12/18/08
Signed Date

Midwest Sales Manager
Title

Shepard Bros., Inc.
Contractor

1.0715 Contract Performance

Termination: None
Reason: Shepard Bros., Inc. has not had any contracts terminated for default.

1.0716 Place of Performance

Place of Performance Full address	**Owner/Operator of facility to be used**	**Percent (%) of Contract value to be Performed at listed Location**
942 Surrey Way Cinti., OH 45245	Jim A Adams	Sales and Contract Administration
20 Eastern Blvd. Canandaigua, NY 14424	Shepard Bros., Inc.	Dealer Preparation and Final Acceptance
PO Box 36, 130 Horizon Park Dr., Penn Yan, NY 14527	Coach & Equipment Manufacturing Corp.	Bus Build and Warranty

1.0717 Environmental Requirements

Energy Efficiency Purchasing Policy – The State shall seek wherever possible to purchase energy efficient products. This may include giving preference to U.S. Environmental Protection Agency (EPA) certified 'Energy Star' products for any category of products for which EPA has established Energy Star certification. For other purchases, the State may include energy efficiency as one of the priority factors to consider when choosing among comparable bids.

Environmental Purchasing Policy – The State of Michigan has committed to encourage the use of products and services that impact the environment less than competing products. This can be best accomplished by including environmental considerations in purchasing decisions, while remaining fiscally responsible, to promote practices that improve worker health, conserve natural resources, and prevent pollution. Environmental components that may be considered in Best Value Purchasing evaluation include: recycled content and recyclability; energy efficiency; and the presence of undesirable materials in the products, especially those toxic chemicals which are persistent and bio-accumulative.

I. Recycled Content and Recyclability

A. Recycled Packaging. The contractor may offer some or all of the following items listed below or provide alternative proposal as to how packaging materials can be reduced, eliminated or otherwise made more environmentally preferable. It is desirable that the contractor offer packaging which:

a. is made from recycled content which meets or exceeds all federal and state recycled content guidelines (currently 35% post-consumer for all corrugated cardboard)
b. minimizes or eliminates the use of polystyrene or other difficult to recycle materials
c. minimizes or eliminates the use packaging and containers and, in the alternative, minimizes or eliminates the use of non-recyclable packaging and containers
d. provides for a return program where packaging can be returned to a specific location for recycling
e. contains materials which are easily recyclable in Michigan.

The contractor is requested to indicate below an estimate of the percentage of recycled materials, if any, contained in each item. Higher percentages of recycled materials are preferred. Product performance is paramount, whether containing recycled material or not; however, preference will be given to products that perform up to specification and are environmentally preferable without compromising quality.

___N/A___ % (Total estimated percentage of recovered material)

___N/A__ % (Estimated percentage of post-consumer material)

___N/A__ % (Estimated percentage of post-industrial waste

Certification

I, _Jimmie Alan Adams__ (name of certifier), am an officer or employee responsible for the performance of this contract and hereby certify that the percentage of recovered material content for EPA-designated products met the applicable contract specifications.

___ _____ (Initial)

II. Materials Identification and Tracking

A. Hazardous Material Identification. 'Hazardous material', as used in this clause, includes any material defined as hazardous under the latest version of federal Emergency Planning and Community Right-to-Know Act of 1986 (including revisions adopted during the term of the contract).

(1) The contractor must list any hazardous material, as defined in §370.20 (a) of 40 CFR, to be delivered under this contract. The hazardous material shall be properly identified and include any applicable identification number, such as National Stock Number or Special Item Number. This information shall also be included on the Material Safety Data Sheet submitted under this contract.

Material (if none, enter 'None')	Identification Number
NONE	

(2) This list must be updated during performance of the contract whenever the Contractor determines that any other material to be delivered under this contract is hazardous.

(3) The contractor agrees to submit, for each item as required prior to award, a Material Safety Data Sheet for each hazardous material identified in paragraph (1) of this clause. Data shall be submitted in accordance with Section 312 of the federal Emergency Planning and Community Right-to-Know Act, whether or not the apparently contractor is the actual manufacturer of these items.

B. Mercury Content. It is the clear intent of state agencies to avoid purchasing products that contain intentionally-added mercury whenever possible. The contractor shall offer mercury-free product alternatives whenever available. Should mercury-free alternatives not exist, as presently is the case with a few select products and devices such as fluorescent lamps or where the alternative is not yet cost competitive, such as dental amalgam, the contractor shall offer the lowest mercury content available for a given application. The contractor shall disclose whenever products contain added-mercury by using the following format.

( ) Product contains added-Mercury (attach an explanation that includes: the amount or concentration of mercury and justification as to why this particular product is essential).
In addition, the contractor shall also ensure that all products to be purchased containing intentionally added-mercury shall be labeled as: "product contains mercury/recycle or dispose of properly." For instances where space constraints limit the amount or size of print, the chemical symbol "Hg" followed by a picture of a trash container with a diagonal line through it shall suffice for labeling requirements.
CONTRACTOR PLEASE NOTE: Michigan Law Prohibits the sale of mercury-containing thermostats, thermometers, sphygmomanometers (blood pressure monitors) and other types of medical devices. For specific details visit: http://www.michigan.gov/deq/0,1607,7-135-3307_29693_4175-160230--,00.html

C. Brominated Flame Retardants (BFR). The contractor shall disclose whether the products being offered contain toxic flame retardants. Contractorders are encouraged to provide BFR-free alternatives when available.

(X) Product does not contain BFR's

( ) Product does contain BFR's (attach an explanation)

D. Ozone Depleting Substances

'Ozone-depleting substance', as used in this clause, means any substance the Environmental Protection Agency designates in 40 CFR part 82 as:

(1) Class I, including, but not limited to, chlorofluorocarbons, halons, carbon tetrachloride, and methyl chloroform; or

(2) Class II, including, but not limited to, hydrochlorofluorocarbons.

The Contractor shall label products which contain or are manufactured with ozone-depleting substances in the manner and to the extent required by 42 U.S.C. 7671j (b), (c), and (d) and 40 CFR part 82, Subpart E, as follows:

'Warning: Contains (or manufactured with, if applicable) _____134A Freon_____ (insert the name of the substance(s).), a substance(s) which harm(s) public health and environment by destroying ozone in the upper atmosphere.'

A. Clean Air and Water

Vendor certifies that any facility to be used in the performance of this contract has all the necessary environmental permits and is in consistent compliance with all applicable environmental requirements and has no outstanding unresolved violations.

The vendor will immediately notify the state, before award, of the receipt of any communication from the Environmental Protection Agency or any state environmental agency, of civil or criminal enforcement for any facility that the vendor proposes to use in the performance of this contract.

_____ (Initial)

B. Emergency Planning and Community Right-to-Know Reporting - By signing this offer, the contractorder certifies that:

(1) The owner or operator of each facility that will be used in the performance of this contract is in compliance with the filing and reporting requirements described in sections 302, 304, 311, 312 and 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) (42 U.S.C. 11001, et. seq.) and section 6607 of the Pollution Prevention Act of 1990 (PPA) (42 U.S.C. 13101, et. seq.). EPCRA filing and reporting requirements include emergency planning notification, release reporting, hazardous chemical inventory reporting, and toxic chemical release inventory (TRI) reporting.

(2) The owner or operator of each facility that will be used in the performance of this contract will maintain compliance with the filing and reporting requirements described in sections 302, 304, 311, 312 and 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) (42 U.S.C. 11001, et. seq.) and section 6607 of the Pollution Prevention Act of 1990 (PPA) (42 U.S.C. 13101, et. seq.) for the life of the contract.

_____ (Initial)

1.0718 Subcontractors

Indicate below **ALL** work to be subcontracted under any resulting Contract (use additional attachment if necessary; estimates are acceptable):

Description of Work to be sub-contracted	**Percent (%) of total contract value to be sub-contracted**	**Sub-contractor's name and principal place of business (City and State)**
Manufacturer of Buses	45% - 65% Varies	Coach & Equipment Manufacturing Corp. Penn Yan, NY

1.0719 Reports and Meetings

[Any Mandatory Reports or Meetings should be included in the Statement of Work]

(a) Reports.
Within thirty (30) days after the Effective Date, the parties shall determine an appropriate set of periodic reports to be issued by Contractor to the State. Such reports may include:

(i) separately address Contractor's performance in each area of the Services;

(ii) for each area of the Services, assess the degree to which Contractor has attained or failed to attain the pertinent objectives in that area, including on-time completion and delivery of Deliverables;

(iii) explain the reasons for any failure to achieve on-time completion and delivery of Deliverables and include a plan for corrective action where appropriate;

(iv) describe any circumstances that Contractor anticipates will impair or prevent on-time completion and delivery of Deliverables in upcoming reporting periods;

(v) include plans for corrective action or risk mitigation where appropriate and describe the status of ongoing problem resolution efforts;

(vi) provide reports setting forth a comparison of actual hours spent by Contractor (including its augmented personnel and Subcontractors) in performing the Project versus hours budgeted by Contractor.

(vii) set forth a record of the material personnel changes that pertain to the Services and describe planned changes during the upcoming month that may affect the Services.

(viii) include such documentation and other information may be mutually agreed to verify compliance with, and meeting the objectives of, this Contract.

(ix) set forth an updated schedule that provides information on the status of upcoming Deliverables, expected dates of delivery (or redelivery) of such Deliverables and estimates on timing for completion of the Project.

(b) Meetings.
Within thirty (30) days after the Effective Date, the parties shall determine an appropriate set of meetings to be held between representatives of the State and Contractor. Contractor shall prepare and circulate an agenda sufficiently in advance of each such meeting to give participants an opportunity to prepare for the meeting. Contractor shall incorporate into such agenda items that the State desires to discuss. At the State's request, Contractor shall prepare and circulate minutes promptly after a meeting.

1.080 Additional Requirements

Deleted – Not Applicable

Article 2, Terms and Conditions

2.000 Contract Structure and Term

2.001 Contract Term

This Contract is for a period of two (2) years beginning March 10, 2009 through March 9, 2011. All outstanding Purchase Orders must also expire upon the termination (cancellation for any of the reasons listed in **Section 2.130**) of the Contract, unless otherwise extended under the Contract. Absent an early termination for any reason, Purchase Orders issued but not expired, by the end of the Contract's stated term, will remain in effect for the balance of the fiscal year for which they were issued.

2.002 Renewal(s)

This Contract may be renewed in writing by mutual agreement of the parties not less than 30 days before its expiration. The Contract may be renewed for up to one (1) additional one-year periods.

2.003 Legal Effect

Contractor shall show acceptance of this Contract by signing two copies of the Contract and returning them to the Contract Administrator. The Contractor shall not proceed with the performance of the work to be done under the Contract, including the purchase of necessary materials, until both parties have signed the Contract to show acceptance of its terms, and the Contractor receives a contract release/purchase order that authorizes and defines specific performance requirements.

Except as otherwise agreed in writing by the parties, the State assumes no liability for costs incurred by Contractor or payment under this Contract, until Contractor is notified in writing that this Contract (or Change Order) has been approved by the State Administrative Board (if required), approved and signed by all the parties, and a Purchase Order against the Contract has been issued.

2.004 Attachments & Exhibits

All Attachments and Exhibits affixed to any and all Statement(s) of Work, or appended to or referencing this Contract, are incorporated in their entirety and form part of this Contract.

2.005 Ordering

As authorized by the Michigan Department of Transportation, Bureau of Passenger Transportation, local units of government and public transit agencies will issue a written Purchase Order to order any Services/Deliverables under this Contract. All orders are subject to the terms and conditions of this Contract. No additional terms and conditions contained on either a Purchase Order apply unless they are also specifically contained in that Purchase Order's accompanying Statement of Work.

2.006 Order of Precedence

(a) The Contract, including any Statements of Work and Exhibits, to the extent not contrary to the Contract, each of which is incorporated for all purposes, constitutes the entire agreement between the parties with respect to the subject matter and supersedes all prior agreements, whether written or oral, with respect to the subject matter and as additional terms and conditions on the purchase order must apply as limited by **Section 2.005.**

(b) In the event of any inconsistency between the terms of the Contract and a Statement of Work, the terms of the Statement of Work will take precedence (as to that Statement of Work only); provided, however, that a Statement of Work may not modify or amend the terms of the Contract, which may be modified or amended only by a formal Contract amendment.

2.007 Headings

Captions and headings used in the Contract are for information and organization purposes. Captions and headings, including inaccurate references, do not, in any way, define or limit the requirements or terms and conditions of the Contract.

2.008 Form, Function & Utility

If the Contract is for use of more than one State agency and if the Deliverable/Service does not the meet the form, function, and utility required by that State agency, that agency may, subject to State purchasing policies, procure the Deliverable/Service from another source.

2.009 Reformation and Severability

Each provision of the Contract is severable from all other provisions of the Contract and, if one or more of the provisions of the Contract is declared invalid, the remaining provisions of the Contract remain in full force and effect.

2.010 Consents and Approvals

Except as expressly provided otherwise in the Contract, if either party requires the consent or approval of the other party for the taking of any action under the Contract, the consent or approval must be in writing and must not be unreasonably withheld or delayed.

2.011 No Waiver of Default

If a party fails to insist upon strict adherence to any term of the Contract then the party has not waived the right to later insist upon strict adherence to that term, or any other term, of the Contract.

2.012 Survival

Any provisions of the Contract that impose continuing obligations on the parties, including without limitation the parties' respective warranty, indemnity and confidentiality obligations, survive the expiration or termination of the Contract for any reason. Specific references to survival in the Contract are solely for identification purposes and not meant to limit or prevent the survival of any other section.

2.020 Contract Administration

2.021 Issuing Office

This Contract is issued by the Department of Management and Budget, Purchasing Operations and Michigan Department of Transportation (collectively, including all other relevant State of Michigan departments and agencies, the "State"). Purchasing Operations is the sole point of contact in the State with regard to all procurement and contractual matters relating to the Contract. Purchasing Operations **is the only State office authorized to change, modify, amend, alter or clarify the prices, specifications, terms and conditions of this Contract.** The Contractor Administrator within Purchasing Operations for this Contract is:

Laura Gyorkos, CPPB
Purchasing Operations
Department of Management and Budget
Mason Bldg, 2nd Floor
PO Box 30026
Lansing, MI 48909
gyorkosL@michigan.gov
517-373-1455

2.022 Contract Compliance Inspector (CCI)

After DMB-PurchOps receives the properly executed Contract, it is anticipated that the Director of Purchasing Operations, in consultation with MDOT will direct the person named below, or any other person so designated, to monitor and coordinate the activities for the Contract on a day-to-day basis during its term. However, monitoring of this Contract implies **no authority to change, modify, clarify, amend, or otherwise alter the prices, terms, conditions and specifications of the Contract as that authority is retained by DMB Purchasing Operations**. The Contract Compliance Inspector for this Contract is:

Michael Frezell, Project Manager
Bureau of Passenger Transportation
Michigan Department of Transportation
frezellm@michigan.gov
PH: (517) 335-0904
Fax: (517) 373-7997

2.023 Project Manager

The following individual will oversee the project:

Michael Frezell, Project Manager
Bureau of Passenger Transportation
Michigan Department of Transportation
frezellm@michigan.gov
PH: (517) 335-0904
Fax: (517) 373-7997

2.024 Change Requests

The State reserves the right to request from time to time any changes to the requirements and specifications of the Contract and the work to be performed by the Contractor under the Contract. During the course of ordinary business, it may become necessary for the State to discontinue certain business practices or create Additional Services/Deliverables. At a minimum, to the extent applicable, the State would like the Contractor to provide a detailed outline of all work to be done, including tasks necessary to accomplish the services/deliverables, timeframes, listing of key personnel assigned, estimated hours for each individual per task, and a complete and detailed cost justification.

If the Contractor does not so notify the State, the Contractor has no right to claim thereafter that it is entitled to additional compensation for performing that service or providing that deliverable.

Change Requests:

(a) By giving Contractor written notice within a reasonable time, the State must be entitled to accept a Contractor proposal for Change, to reject it, or to reach another agreement with Contractor. Should the parties agree on carrying out a Change, a written Contract Change Notice must be prepared and issued under this Contract, describing the Change and its effects on the Services and any affected components of this Contract (a "Contract Change Notice").

(b) No proposed Change must be performed until the proposed Change has been specified in a duly executed Contract Change Notice issued by the Department of Management and Budget, Purchasing Operations.

(c) If the State requests or directs the Contractor to perform any activities that Contractor believes constitute a Change, the Contractor must notify the State that it believes the requested activities are a Change before beginning to work on the requested activities. If the Contractor fails to notify the State before beginning to work on the requested activities, then the Contractor waives any right to assert any claim for additional compensation or time for performing the requested activities. If the Contractor

commences performing work outside the scope of this Contract and then ceases performing that work, the Contractor must, at the request of the State, retract any out-of-scope work that would adversely affect the Contract.

2.025 Notices

Any notice given to a party under the Contract must be deemed effective, if addressed to the party as addressed below, upon: (i) delivery, if hand delivered; (ii) receipt of a confirmed transmission by facsimile if a copy of the notice is sent by another means specified in this Section; (iii) the third Business Day after being sent by U.S. mail, postage pre-paid, return receipt requested; or (iv) the next Business Day after being sent by a nationally recognized overnight express courier with a reliable tracking system.

State:
State of Michigan
Purchasing Operations
Attention: Laura Gyorkos
PO Box 30026
530 West Allegan
Lansing, Michigan 48909

-

Contractor: Shepard Bros., Inc.
Name: Jim Adams
Address: 942 Surrey Way
Cincinnati, OH 45245

Either party may change its address where notices are to be sent by giving notice according to this Section.

2.026 Binding Commitments

Representatives of Contractor must have the authority to make binding commitments on Contractor's behalf within the bounds set forth in the table. Contractor may change the representatives from time to time upon written notice.

2.027 Relationship of the Parties

The relationship between the State and Contractor is that of client and independent contractor. No agent, employee, or servant of Contractor or any of its Subcontractors must be or must be deemed to be an employee, agent or servant of the State for any reason. Contractor will be solely and entirely responsible for its acts and the acts of its agents, employees, servants and Subcontractors during the performance of the Contract.

2.028 Covenant of Good Faith

Each party must act reasonably and in good faith. Unless stated otherwise in the Contract, the parties will not unreasonably delay, condition or withhold the giving of any consent, decision or approval that is either requested or reasonably required of them in order for the other party to perform its responsibilities under the Contract.

2.029 Assignments

(a) Neither party may assign the Contract, or assign or delegate any of its duties or obligations under the Contract, to any other party (whether by operation of law or otherwise), without the prior written consent of the other party; provided, however, that the State may assign the Contract to any other State agency, department, division or department without the prior consent of Contractor and Contractor may assign the Contract to an affiliate so long as the affiliate is adequately capitalized and can provide adequate assurances that the affiliate can perform the Contract. The State may withhold consent from proposed assignments, subcontracts, or novations when the transfer of responsibility would operate to decrease the State's likelihood of receiving performance on the Contract or the State's ability to recover damages.

(b) Contractor may not, without the prior written approval of the State, assign its right to receive payments due under the Contract. If the State permits an assignment, the Contractor is not relieved of its responsibility to perform any of its contractual duties, and the requirement under the Contract that all payments must be made to one entity continues.

(c) If the Contractor intends to assign the contract or any of the Contractor's rights or duties under the Contract, the Contractor must notify the State in writing at least 90 days before the assignment. The Contractor also must provide the State with adequate information about the assignee within a reasonable amount of time before the assignment for the State to determine whether to approve the assignment.

2.030 General Provisions

2.031 Media Releases

News releases (including promotional literature and commercial advertisements) pertaining to this Contract or project to which it relates shall not be made without prior written State approval, and then only in accordance with the explicit written instructions from the State. No results of the activities associated with the RFP and Contract are to be released without prior written approval of the State and then only to persons designated.

2.032 Contract Distribution

Purchasing Operations retains the sole right of Contract distribution to all State agencies and local units of government unless other arrangements are authorized by Purchasing Operations.

2.033 Permits

Contractor must obtain and pay any associated costs for all required governmental permits, licenses and approvals for the delivery, installation and performance of the Services. The State must pay for all costs and expenses incurred in obtaining and maintaining any necessary easements or right of way.

2.034 Website Incorporation

The State is not bound by any content on the Contractor's website, even if the Contractor's documentation specifically referenced that content and attempts to incorporate it into any other communication, unless the State has actual knowledge of the content and has expressly agreed to be bound by it in a writing that has been manually signed by an authorized representative of the State.

2.035 Future Bidding Preclusion

Contractor acknowledges that, to the extent this Contract involves the creation, research, investigation or generation of a future RFP, it may be precluded from bidding on the subsequent RFP. The State reserves the right to disqualify any bidder if the State determines that the bidder has used its position (whether as an incumbent Contractor, or as a Contractor hired to assist with the RFP development, or as a Vendor offering free assistance) to gain a competitive advantage on the RFP.

2.036 Freedom of Information

All information in any proposal submitted to the State by Contractor and this Contract is subject to the provisions of the Michigan Freedom of Information Act, 1976 Public Act No. 442, as amended, MCL 15.231, et seq (the "FOIA").

2.037 Disaster Recovery

Contractor and the State recognize that the State provides essential services in times of natural or man-made disasters. Therefore, except as so mandated by Federal disaster response requirements, Contractor personnel dedicated to providing Services/Deliverables under this Contract will provide the State with priority service for repair and work around in the event of a natural or man-made disaster.

2.040 Financial Provisions

2.041 Fixed Prices for Services/Deliverables

Each Statement of Work or Purchase Order issued under this Contract shall specify (or indicate by reference to the appropriate Contract Exhibit) the firm, fixed prices for all Services/Deliverables, and the associated payment milestones and payment amounts. The State may make progress payments to the Contractor when requested as work progresses, but not more frequently than monthly, in amounts approved by the Contract Administrator, after negotiation. Contractor must show verification of measurable progress at the time of requesting progress payments.

2.042 Adjustments for Reductions in Scope of Services/Deliverables

If the scope of the Services/Deliverables under any Statement of Work issued under this Contract is subsequently reduced by the State, the parties shall negotiate an equitable reduction in Contractor's charges under such Statement of Work commensurate with the reduction in scope.

2.043 Services/Deliverables Covered

For all Services/Deliverables to be provided by Contractor (and its Subcontractors, if any) under this Contract, the State shall not be obligated to pay any amounts in addition to the charges specified in this Contract.

2.044 Invoicing and Payment – In General

The contractor shall submit two (2) copies of invoices, one (1) to the "Bill To" address and one (1) the "Ship To" address.

2.045 Pro-ration

To the extent there are any Services that are to be paid for on a monthly basis, the cost of such Services shall be pro-rated for any partial month.

2.046 Antitrust Assignment

The Contractor assigns to the State any claim for overcharges resulting from antitrust violations to the extent that those violations concern materials or services supplied by third parties to the Contractor, toward fulfillment of this Contract.

2.047 Final Payment

The making of final payment by the State, local units of government, and local transit agencies to Contractor does not constitute a waiver by either party of any rights or other claims as to the other party's continuing obligations under the Contract, nor will it constitute a waiver of any claims by one party against the other arising from unsettled claims or failure by a party to comply with this Contract, including claims for Services and Deliverables not reasonably known until after acceptance to be defective or substandard. Contractor's acceptance of final payment by the State, local units of government, and local transit agencies under this Contract shall constitute a waiver of all claims by Contractor against the State, local units of government, and local transit agencies for payment under this Contract, other than those claims previously filed in writing on a timely basis and still unsettled.

2.048 Electronic Payment Requirement

Electronic transfer of funds is required for payments on State Contracts. Contractors are required to register with the State electronically at http://www.cpexpress.state.mi.us. As stated in Public Act 431 of 1984, all contracts that the State enters into for the purchase of goods and services shall provide that payment will be made by electronic fund transfer (EFT).

2.050 Taxes

2.051 Employment Taxes

Contractors are expected to collect and pay all applicable federal, state, and local employment taxes, including the taxes.

2.052 Sales and Use Taxes

Contractors are required to be registered and to remit sales and use taxes on taxable sales of tangible personal property or services delivered into the State. Contractors that lack sufficient presence in Michigan to be required to register and pay tax must do so as a volunteer. This requirement extends to: (1) all members of any controlled group as defined in § 1563(a) of the Internal Revenue Code and applicable regulations of which the company is a member, and (2) all organizations under common control as defined in § 414(c) of the Internal Revenue Code and applicable regulations of which the company is a member that make sales at retail for delivery into the State are registered with the State for the collection and remittance of sales and use taxes. In applying treasury regulations defining "two or more trades or businesses under common control" the term "organization" means sole proprietorship, a partnership (as defined in § 701(a)(2) of the Internal Revenue Code), a trust, an estate, a corporation, or a limited liability company.

2.060 Contract Management

2.061 Contractor Personnel Qualifications

All persons assigned by Contractor to the performance of Services under this Contract must be employees of Contractor or its majority-owned (directly or indirectly, at any tier) subsidiaries (or a State-approved Subcontractor) and must be fully qualified to perform the work assigned to them. Contractor must include a similar provision in any subcontract entered into with a Subcontractor. For the purposes of this Contract, independent contractors engaged by Contractor solely in a staff augmentation role must be treated by the State as if they were employees of Contractor for this Contract only; however, the State understands that the relationship between Contractor and Subcontractor is an independent contractor relationship.

2.062 Contractor Key Personnel

(a) The Contractor must provide the Contract Compliance Inspector with the names of the Key Personnel.

(b) Key Personnel must be dedicated as defined in the Statement of Work to the Project for its duration in the applicable Statement of Work with respect to other individuals designated as Key Personnel for that Statement of Work.

(c) The State will have the right to recommend and approve in writing the initial assignment, as well as any proposed reassignment or replacement, of any Key Personnel. Before assigning an individual to any Key Personnel position, Contractor will notify the State of the proposed assignment, will introduce the individual to the appropriate State representatives, and will provide the State with a resume and any other information about the individual reasonably requested by the State. The State reserves the right to interview the individual before granting written approval. In the event the State finds a proposed individual unacceptable, the State will provide a written explanation including reasonable detail outlining the reasons for the rejection.

(d) Contractor must not remove any Key Personnel from their assigned roles or the Contract without the prior written consent of the State. The Contractor's removal of Key Personnel without the prior written consent of the State is an unauthorized removal ("Unauthorized Removal"). Unauthorized Removals does not include replacing Key Personnel for reasons beyond the reasonable control of Contractor, including illness, disability, leave of absence, personal emergency circumstances, resignation or for cause termination of the Key Personnel's employment. Unauthorized Removals does not include replacing Key Personnel because of promotions or other job movements allowed by Contractor personnel policies or Collective Bargaining Agreement(s) as long as the State receives prior written notice before shadowing occurs and Contractor provides 30 days of shadowing unless parties agree to a different time period. The Contractor with the State must review any Key Personnel replacements, and appropriate transition planning will be established. Any Unauthorized Removal may be considered by the State to be a material breach of the Contract, in respect of which the State may elect to exercise its termination and cancellation rights.

(e) The Contractor must notify the Contract Compliance Inspector and the Contract Administrator at least 10 business days before redeploying non-Key Personnel, who are dedicated to primarily to the Project, to other projects. If the State does not object to the redeployment by its scheduled date, the Contractor may then redeploy the non-Key Personnel.

2.063 Re-assignment of Personnel at the State's Request

The State reserves the right to require the removal from the Project of Contractor personnel found, in the judgment of the State, to be unacceptable. The State's request must be written with reasonable detail outlining the reasons for the removal request. Additionally, the State's request must be based on legitimate, good-faith reasons. Replacement personnel for the removed person must be fully qualified for the position. If the State exercises this right, and the Contractor cannot immediately replace the removed personnel, the State agrees to an equitable adjustment in schedule or other terms that may be affected by the State's required removal. If any incident with removed personnel results in delay not reasonably anticipatable under the circumstances and which is attributable to the State, the applicable SLAs for the affected Service will not be counted for a time as agreed to by the parties.

2.064 Contractor Personnel Location

All staff assigned by Contractor to work on the Contract will perform their duties either primarily at Contractor's offices and facilities or at State facilities. Without limiting the generality of the foregoing, Key Personnel will, at a minimum, spend at least the amount of time on-site at State, local units of government, and local transit agencies facilities as indicated in the applicable Statement of Work. Subject to availability, selected Contractor personnel may be assigned office space to be shared with State personnel.

2.065 Contractor Identification

Contractor employees must be clearly identifiable while on State property by wearing a State-issued badge, as required. Contractor employees are required to clearly identify themselves and the company they work for whenever making contact with State personnel by telephone or other means.

2.066 Cooperation with Third Parties

Contractor agrees to cause its personnel and the personnel of any Subcontractors to cooperate with the State and its agents and other contractors including the State's Quality Assurance personnel. As reasonably requested by the State in writing, the Contractor will provide to the State's agents and other contractors reasonable access to Contractor's Project personnel, systems and facilities to the extent the access relates to activities specifically associated with this Contract and will not interfere or jeopardize the safety or operation of the systems or facilities. The State acknowledges that Contractor's time schedule for the Contract is very specific and agrees not to unnecessarily or unreasonably interfere with, delay or otherwise impeded Contractor's performance under this Contract with the requests for access.

2.067 Contract Management Responsibilities

The Contractor will be required to assume responsibility for all contractual activities, whether or not that Contractor performs them. Further, the State will consider the Contractor to be the sole point of contact with regard to contractual matters, including payment of any and all charges resulting from the anticipated Contract. If any part of the work is to be subcontracted, the Contract must include a list of subcontractors, including firm name and address, contact person and a complete description of work to be subcontracted. The State reserves the right to approve subcontractors and to require the Contractor to replace subcontractors found to be unacceptable. The Contractor is totally responsible for adherence by the subcontractor to all provisions of the Contract. Any change in subcontractors must be approved by the State, in writing, prior to such change.

2.068 Contractor Return of State Equipment/Resources

The Contractor must return to the State any State-furnished equipment, facilities and other resources when no longer required for the Contract in the same condition as when provided by the State, reasonable wear and tear excepted.

2.070 Subcontracting by Contractor

2.071 Contractor full Responsibility

Contractor shall have full responsibility for the successful performance and completion of all of the Services and Deliverables. The State will consider Contractor to be the sole point of contact with regard to all contractual matters under this Contract, including payment of any and all charges for Services and Deliverables.

2.072 State Consent to delegation

Contractor shall not delegate any duties under this Contract to a Subcontractor unless the Department of Management and Budget, Purchasing Operations has given written consent to such delegation. The State shall have the right of prior written approval of all Subcontractors and to require Contractor to replace any Subcontractors found, in the reasonable judgment of the State, to be unacceptable. The State's request shall be written with reasonable detail outlining the reasons for the removal request. Additionally, the State's request shall be based on legitimate, good-faith reasons. Replacement Subcontractor(s) for the removed Subcontractor shall be fully qualified for the position. If the State exercises this right, and the Contractor cannot immediately replace the removed Subcontractor, the State will agree to an equitable adjustment in schedule or other terms that may be affected by the State's required removal. If any such incident with a removed Subcontractor results in delay not reasonable anticipatable under the circumstances and which is attributable to the State, the applicable SLA for the affected Work will not be counted in time agreed upon by the parties.

2.073 Subcontractor bound to Contract

In any subcontracts entered into by Contractor for the performance of the Services, Contractor shall require the Subcontractor, to the extent of the Services to be performed by the Subcontractor, to be bound to Contractor by the terms of this Contract and to assume toward Contractor all of the obligations and responsibilities that Contractor, by this Contract, assumes toward the State. The State reserves the right to receive copies of and review all subcontracts, although Contractor may delete or mask any proprietary information, including pricing, contained in such contracts before providing them to the State. The management of any Subcontractor will be the responsibility of Contractor, and Contractor shall remain responsible for the performance of its Subcontractors to the same extent as if Contractor had not subcontracted such performance. Contractor shall make all payments to Subcontractors or suppliers of Contractor. Except as otherwise agreed in writing by the State and Contractor, the State will not be obligated to direct payments for the Services other than to Contractor. The State's written approval of any Subcontractor engaged by Contractor to perform any obligation under this Contract shall not relieve Contractor of any obligations or performance required under this Contract. Attached as **Exhibit A** is a list of the Subcontractors, if any, approved by the State as of the execution of this Contract, together with a copy of the applicable subcontract.

2.074 Flow Down

Except where specifically approved in writing by the State on a case-by-case basis, Contractor shall flow down the obligations in **Sections 2.031, 2.060, 2.100, 2.110, 2.120, 2.130, 2.200** in all of its agreements with any Subcontractors.

2.075 Competitive Selection

The Contractor shall select subcontractors (including suppliers) on a competitive basis to the maximum practical extent consistent with the objectives and requirements of the Contract.

2.080 State Responsibilities

2.081 Equipment

The State will provide only the equipment and resources identified in the Statements of Work and other Contract Exhibits.

2.082 Facilities

The State must designate space as long as it is available and as provided in the Statement of Work, to house the Contractor's personnel whom the parties agree will perform the Services/Deliverables at State facilities (collectively, the "State Facilities"). The Contractor must have reasonable access to, and unless agreed otherwise by the parties in writing must observe and comply with all rules and regulations relating to each of the State Facilities (including hours of operation) used by the Contractor in the course of providing the Services. Contractor agrees that it will not, without the prior written consent of the State, use any State Facilities or access any State information systems provided for the Contractor's use, or to which the Contractor otherwise gains access in the course of performing the Services, for any purpose other than providing the Services to the State.

2.090 Security

2.091 Background Checks

On a case-by-case basis, the State may investigate the Contractor's personnel before they may have access to State facilities and systems. The scope of the background check is at the discretion of the State and the results will be used to determine Contractor personnel eligibility for working within State facilities and systems. The investigations will include Michigan State Police Background checks (ICHAT) and may include the National Crime Information Center (NCIC) Finger Prints. Proposed Contractor personnel may be required to complete and submit an RI-8 Fingerprint Card for the NCIC Finger Print Check. Any request for background checks will be initiated by the State and will be reasonably related to the type of work requested.

All Contractor personnel will also be expected to comply with the State's security and acceptable use policies for State IT equipment and resources. See http://www.michigan.gov/dit. Furthermore, Contractor personnel will be expected to agree to the State's security and acceptable use policies before the Contractor personnel will be accepted as a resource to perform work for the State. It is expected the Contractor will present these documents to the prospective employee before the Contractor presents the individual to the State as a proposed resource. Contractor staff will be expected to comply with all Physical Security procedures in place within the facilities where they are working.

2.092 Security Breach Notification

If the Contractor breaches this Section, the Contractor must (i) promptly cure any deficiencies and (ii) comply with any applicable federal and state laws and regulations pertaining to unauthorized disclosures. Contractor and the State will cooperate to mitigate, to the extent practicable, the effects of any breach, intrusion, or unauthorized use or disclosure. Contractor must report to the State in writing any use or disclosure of Confidential Information, whether suspected or actual, other than as provided for by the Contract within 10 days of becoming aware of the use or disclosure or the shorter time period as is reasonable under the circumstances.

2.093 PCI Data Security Requirements

Deleted – Not Applicable

2.100 Confidentiality

2.101 Confidentiality

Contractor and the State each acknowledge that the other possesses and will continue to possess confidential information that has been developed or received by it. As used in this Section, "Confidential Information" of Contractor must mean all non-public proprietary information of Contractor (other than Confidential Information of the State as defined below) which is marked confidential, restricted, proprietary or with a similar designation. "Confidential Information" of the State must mean any information which is retained in confidence by the State (or otherwise required to be held in confidence by the State under applicable federal, state and local laws and

regulations) or which, in the case of tangible materials provided to Contractor by the State under its performance under this Contract, is marked as confidential, proprietary or with a similar designation by the State. "Confidential Information" excludes any information (including this Contract) that is publicly available under the Michigan FOIA.

2.102 Protection and Destruction of Confidential Information

The State and Contractor will each use at least the same degree of care to prevent disclosing to third parties the Confidential Information of the other as it employs to avoid unauthorized disclosure, publication or dissemination of its own confidential information of like character, but in no event less than reasonable care. Neither Contractor nor the State will (i) make any use of the Confidential Information of the other except as contemplated by this Contract, (ii) acquire any right in or assert any lien against the Confidential Information of the other, or (iii) if requested to do so, refuse for any reason to promptly return the other party's Confidential Information to the other party. Each party will limit disclosure of the other party's Confidential Information to employees and Subcontractors who must have access to fulfill the purposes of this Contract. Disclosure to, and use by, a Subcontractor is permissible where (A) use of a Subcontractor is authorized under this Contract, (B) the disclosure is necessary or otherwise naturally occurs in connection with work that is within the Subcontractor's scope of responsibility, and (C) Contractor obligates the Subcontractor in a written Contract to maintain the State's Confidential Information in confidence. At the State's request, any employee of Contractor and of any Subcontractor having access or continued access to the State's Confidential Information may be required to execute an acknowledgment that the employee has been advised of Contractor's and the Subcontractor's obligations under this Section and of the employee's obligation to Contractor or Subcontractor, as the case may be, to protect the Confidential Information from unauthorized use or disclosure.

Promptly upon termination or cancellation of the Contract for any reason, Contractor must certify to the State that Contractor has destroyed all State Confidential Information.

2.103 Exclusions

Notwithstanding the foregoing, the provisions of **Section 2.080** will not apply to any particular information which the State or Contractor can demonstrate (i) was, at the time of disclosure to it, in the public domain; (ii) after disclosure to it, is published or otherwise becomes part of the public domain through no fault of the receiving party; (iii) was in the possession of the receiving party at the time of disclosure to it without an obligation of confidentiality; (iv) was received after disclosure to it from a third party who had a lawful right to disclose the information to it without any obligation to restrict its further disclosure; or (v) was independently developed by the receiving party without reference to Confidential Information of the furnishing party. Further, the provisions of **Section 2.080** will not apply to any particular Confidential Information to the extent the receiving party is required by law to disclose the Confidential Information, provided that the receiving party (i) promptly provides the furnishing party with notice of the legal request, and (ii) assists the furnishing party in resisting or limiting the scope of the disclosure as reasonably requested by the furnishing party.

2.104 No Implied Rights

Nothing contained in this Section must be construed as obligating a party to disclose any particular Confidential Information to the other party, or as granting to or conferring on a party, expressly or impliedly, any right or license to the Confidential Information of the other party.

2.105 Respective Obligations

The parties' respective obligations under this Section must survive the termination or expiration of this Contract for any reason.

2.110 Records and Inspections

2.111 Inspection of Work Performed

All goods are subject to inspection and testing. In the event goods are defective in material or workmanship, or otherwise fail to meet the requirements of the Contract, the State shall have the right to reject goods or retain the goods and correct the defects. The Contractor shall pay the Michigan Department of Transportation, Bureau of Passenger Transportation; authorized local units of government; and public transit agencies for expenses incurred in correcting defects. Rejected goods will be held for 45 days after delivery. The Contractor must arrange for the return of said goods, including paying for handling, packing, and transportation costs. The Michigan Department of Transportation, Bureau of Passenger Transportation; authorized local units of government; and public transit agencies has the authority to dispose of goods without further liability to the Michigan Department of Transportation, Bureau of Passenger Transportation; authorized local units of government; and public transit agencies in the event the Contractor fails to make arrangements within the specified time period.

The State's authorized representatives must at all reasonable times and with 10 days prior written request, have the right to enter Contractor's premises, or any other places, where the Services are being performed, and must have access, upon reasonable request, to interim drafts of Deliverables or work-in-progress. Upon 10 Days prior written notice and at all reasonable times, the State's representatives must be allowed to inspect, monitor, or otherwise evaluate the work being performed and to the extent that the access will not reasonably interfere or jeopardize the safety or operation of the systems or facilities. Contractor must provide all reasonable facilities and assistance for the State's representatives.

Pilot model and plant inspections, the contractor, shall allow the following:

1. Conductions of a **pre-pilot model review meeting** at the manufacturer's facility, or a mutually agreed upon location (one (1) per contract period).

2. Conduction of a **pilot model inspection and mid-production inspection** at the manufacturer's facility, or a mutually agreed upon location (one (1) per contract period).

3. Contract shall allow for **periodic production/plant inspections** by the Michigan Department of Transportation, Bureau of Passenger Transportation (two (2) per contract period).

Final inspection will be made at a Michigan location. The contract shall have a factory dealer with repair facilities and personnel in Michigan, or may be an out-of-state factory dealer with repair facilities and personnel in Michigan capable of handling final inspections, corrections, and warranty follow-up.

NOTE: Contractor Responsible for Travel Expenses

The contractor WILL BE responsible for transportation (air fare, rail fare, car rental, taxi, or mileage), lodging, parking expenses, meals, and tips for up to two (2) individuals, as determined by the Michigan Department of Transportation, Bureau of Passenger Transportation, for involvement in any of the above pilot model review or plant inspections. All travel expenses shall be based on the Michigan Department of Management and Budget, Vehicle and Travel Services *Schedule of Travel Rates for Classified and Unclassified Employees Effective January 1, 2009* or subsequent updates.

http://www.michigan.gov/documents/dmb/ttrateJan2009_259895_7.pdf

2.112 Examination of Records

The contractor will be subject to the Federal Transportation Administration's (FTA) 49 DFR Part 663 for Pre-Award and Post Delivery Audits of Rolling Stock Purchases. The Michigan Department of Transportation, Bureau of

Passenger Transportation, will conduct a pre-award audit of the contractor that is being considered to verify that the contractor has successfully met all of the following requirements:

1. Federal Motor Vehicle Safety Requirements
2. Federal Buy American Requirements, and
3. Grantee's Bid Specifications. Post-Delivery Audits shall include a "Road Test" of each unit.

For seven years after the Contractor provides any work under this Contract (the "Audit Period"), the State may examine and copy any of Contractor's books, records, documents and papers pertinent to establishing Contractor's compliance with the Contract and with applicable laws and rules. The State must notify the Contractor 20 days before examining the Contractor's books and records. The State does not have the right to review any information deemed confidential by the Contractor to the extent access would require the confidential information to become publicly available. This provision also applies to the books, records, accounts, documents and papers, in print or electronic form, of any parent, affiliated or subsidiary organization of Contractor, or any Subcontractor of Contractor performing services in connection with the Contract.

2.113 Retention of Records

Contractor must maintain at least until the end of the Audit Period all pertinent financial and accounting records (including time sheets and payroll records, and information pertaining to the Contract and to the Services, equipment, and commodities provided under the Contract) pertaining to the Contract according to generally accepted accounting principles and other procedures specified in this Section. Financial and accounting records must be made available, upon request, to the State at any time during the Audit Period. If an audit, litigation, or other action involving Contractor's records is initiated before the end of the Audit Period, the records must be retained until all issues arising out of the audit, litigation, or other action are resolved or until the end of the Audit Period, whichever is later.

2.114 Audit Resolution

If necessary, the Contractor and the State will meet to review each audit report promptly after issuance. The Contractor will respond to each audit report in writing within 30 days from receipt of the report, unless a shorter response time is specified in the report. The Contractor and the State must develop, agree upon and monitor an action plan to promptly address and resolve any deficiencies, concerns, and/or recommendations in the audit report.

2.115 Errors

(a) If the audit demonstrates any errors in the documents provided to the State, then the amount in error must be reflected as a credit or debit on the next invoice and in subsequent invoices until the amount is paid or refunded in full. However, a credit or debit may not be carried for more than four invoices. If a balance remains after four invoices, then the remaining amount will be due as a payment or refund within 45 days of the last quarterly invoice that the balance appeared on or termination of the contract, whichever is earlier.

(b) In addition to other available remedies, the difference between the payment received and the correct payment amount is greater than 10%, then the Contractor must pay all of the reasonable costs of the audit.

2.120 Warranties and Equipment

2.121 Warranties and Representations

The Contractor represents and warrants:

(a) It is capable in all respects of fulfilling and must fulfill all of its obligations under this Contract. The performance of all obligations under this Contract must be provided in a timely, professional, and workman-like manner and must meet the performance and operational standards required under this Contract.

(b) The Contract Appendices, Attachments and Exhibits identify the equipment and software and services necessary for the Deliverable(s) to perform and Services to operate in compliance with the Contract's requirements and other standards of performance.

(c) It is the lawful owner or licensee of any Deliverable licensed or sold to the State by Contractor or developed by Contractor under this Contract, and Contractor has all of the rights necessary to convey to the State the ownership rights or licensed use, as applicable, of any and all Deliverables. None of the Deliverables provided by Contractor to the State under this Contract, nor their use by the State, will infringe the patent, copyright, trade secret, or other proprietary rights of any third party.

(d) If, under this Contract, Contractor procures any equipment, software or other Deliverable for the State (including equipment, software and other Deliverables manufactured, re-marketed or otherwise sold by Contractor under Contractor's name), then in addition to Contractor's other responsibilities with respect to the items in this Contract, Contractor must assign or otherwise transfer to the State or its designees, or afford the State the benefits of, any manufacturer's warranty for the Deliverable.

(e) The contract signatory has the power and authority, including any necessary corporate authorizations, necessary to enter into this Contract, on behalf of Contractor.

(f) It is qualified and registered to transact business in all locations where required.

(g) Neither the Contractor nor any Affiliates, nor any employee of either, has, must have, or must acquire, any contractual, financial, business, or other interest, direct or indirect, that would conflict in any manner or degree with Contractor's performance of its duties and responsibilities to the State under this Contract or otherwise create an appearance of impropriety with respect to the award or performance of this Agreement. Contractor must notify the State about the nature of the conflict or appearance of impropriety within two days of learning about it.

(h) Neither Contractor nor any Affiliates, nor any employee of either has accepted or must accept anything of value based on an understanding that the actions of the Contractor or Affiliates or employee on behalf of the State would be influenced. Contractor must not attempt to influence any State employee by the direct or indirect offer of anything of value.

(i) Neither Contractor nor any Affiliates, nor any employee of either has paid or agreed to pay any person, other than bona fide employees and consultants working solely for Contractor or the Affiliate, any fee, commission, percentage, brokerage fee, gift, or any other consideration, contingent upon or resulting from the award or making of this Contract.

(j) The prices proposed by Contractor were arrived at independently, without consultation, communication, or agreement with any other bidder for the purpose of restricting competition; the prices quoted were not knowingly disclosed by Contractor to any other bidder; and no attempt was made by Contractor to induce any other person to submit or not submit a proposal for the purpose of restricting competition.

(k) All financial statements, reports, and other information furnished by Contractor to the State as part of its response to the RFP or otherwise in connection with the award of this Contract fairly and accurately represent the business, properties, financial condition, and results of operations of Contractor as of the respective dates, or for the respective periods, covered by the financial statements, reports, other information. Since the respective dates or periods covered by the financial statements, reports, or other information, there have been no material adverse change in the business, properties, financial condition, or results of operations of Contractor.

(l) All written information furnished to the State by or for the Contractor in connection with this Contract, including its bid, is true, accurate, and complete, and contains no untrue statement of material fact or omits any material fact necessary to make the information not misleading.

(m) It is not in material default or breach of any other contract or agreement that it may have with the State or any of its departments, commissions, boards, or agencies. Contractor further represents and warrants that it has not been a party to any contract with the State or any of its departments that was terminated by the State or the department within the previous five years for the reason that Contractor failed to perform or otherwise breached an obligation of the contract.
(n) If any of the certifications, representations, or disclosures made in the Contractor's original bid response change after contract award, the Contractor is required to report those changes immediately to the Department of Management and Budget, Purchasing Operations.

2.122 Warranty of Merchantability

Goods provided by Contractor under this agreement shall be merchantable. All goods provided under this Contract shall be of good quality within the description given by the State, shall be fit for their ordinary purpose, shall be adequately contained and packaged within the description given by the State, shall conform to the agreed upon specifications, and shall conform to the affirmations of fact made by the Contractor or on the container or label.

2.123 Warranty of Fitness for a Particular Purpose

When the Contractor has reason to know or knows any particular purpose for which the goods are required, and the State is relying on the Contractor's skill or judgment to select or furnish suitable goods, there is a warranty that the goods are fit for such purpose.

2.124 Warranty of Title

Contractor shall, in providing goods to the State, convey good title in those goods, whose transfer is right and lawful. All goods provided by Contractor shall be delivered free from any security interest, lien, or encumbrance of which the State, at the time of contracting, has no knowledge. Goods provided by Contractor, under this Contract, shall be delivered free of any rightful claim of any third person by of infringement or the like.

2.125 Equipment Warranty

To the extent Contractor is responsible under this Contract for maintaining equipment/system(s), Contractor represents and warrants that it will maintain the equipment/system(s) in good operating condition and will undertake all repairs and preventive maintenance according to the applicable manufacturer's recommendations for the period specified in this Contract.

A. Principle Period of Maintenance (PPM) will be the same hours as the State's normal working hours (currently Monday through Friday, 8:00 A.M. to 4:00 P.M., excluding a one (1) hour lunch period, excepting State observed holidays).

B. The PPM hours may be changed upon thirty (30) days written notice by mutual agreement, except the Contractor shall make every reasonable effort to change his/her schedule in a shorter period of time.

The Contractor represents and warrants that the equipment/system(s) are in good operating condition and operate and perform to the requirements and other standards of performance contained in this Contract, when installed, at the time of Final Acceptance by the Michigan Department of Transportation (MDOT), Bureau of Passenger Transportation; authorized local units of government; and public transit agencies., and for a period of one year commencing upon the first day following Final Acceptance.

Within five (5) business days of notification from the Michigan Department of Transportation (MDOT), Bureau of Passenger Transportation; authorized local units of government; and public transit agencies., the Contractor must adjust, repair or replace all equipment that is defective or not performing in compliance with the Contract. The Contractor must assume all costs for replacing parts or units and their installation including transportation and delivery fees, if any.

The Contractor must provide a toll-free telephone number to allow the Michigan Department of Transportation (MDOT), Bureau of Passenger Transportation; authorized local units of government; and public transit agencies. to report equipment failures and problems to be remedied by the Contractor.

The Contractor agrees that all warranty service it provides under this Contract must be performed by Original Equipment Manufacturer (OEM) trained, certified and authorized technicians.

The Contractor is the sole point of contact for warranty service. The Contractor warrants that it will pass through to the Michigan Department of Transportation (MDOT), Bureau of Passenger Transportation; authorized local units of government; and public transit agencies any warranties obtained or available from the original equipment manufacturer, including any replacement, upgraded, or additional equipment warranties.

All warranty work must be performed at a mutually agreed upon location between the contractor and authorized local units of government and public transit agencies.

2.126 Equipment to be New

If applicable, all equipment provided under this Contract by Contractor shall be new where Contractor has knowledge regarding whether the equipment is new or assembled from new or serviceable used parts that are like new in performance or has the option of selecting one or the other. Equipment that is assembled from new or serviceable used parts that are like new in performance is acceptable where Contractor does not have knowledge or the ability to select one or other, unless specifically agreed otherwise in writing by the State.

2.127 Equipment Installation

Non-Factory Installed Equipment

The contractor submitted a listing of equipment that is not installed at the point of bus manufacture. The list of non-factory installed equipment identifies the item number(s) to which it applies and lists the description of equipment involved.

Optional Equipment and Accessories

Factory equipment not specifically listed in the contract and/or State of Michigan bus specifications may be added in accordance with the current Kelley Blue Book in effect at the time of order, using the Dealer Cost Column. Authorized local units of government and public transit agencies may implement such changes on a direct basis with the contractor.

2.128 Prohibited Products

The State will not accept salvage, distressed, outdated or discontinued merchandise. Shipping of such merchandise to any State agency, as a result of an order placed against the Contract, shall be considered default by the Contractor of the terms and conditions of the Contract and may result in cancellation of the Contract by the State. The brand and product number offered for all items shall remain consistent for the term of the Contract, unless Purchasing Operations has approved a change order pursuant to **Section 2.024**.

2.129 Consequences For Breach

In addition to any remedies available in law, if the Contractor breaches any of the warranties contained in this section, the breach may be considered as a default in the performance of a material obligation of this Contract.

2.130 Insurance

2.131 Liability Insurance

The Contractor must provide proof of the minimum levels of insurance coverage as indicated below. The insurance must protect the State from claims which may arise out of or result from the Contractor's performance of services under the terms of this Contract, whether the services are performed by the Contractor, or by any subcontractor, or by anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable.

The Contractor waives all rights against the State of Michigan, its departments, divisions, agencies, offices, commissions, officers, employees and agents for recovery of damages to the extent these damages are covered by the insurance policies the Contractor is required to maintain under this Contract.

All insurance coverages provided relative to this Contract/Purchase Order are PRIMARY and NON-CONTRIBUTING to any comparable liability insurance (including self-insurances) carried by the State.

The insurance must be written for not less than any minimum coverage specified in this Contract or required by law, whichever is greater.

The insurers selected by Contractor must have an A.M. Best rating of A or better, or as otherwise approved in writing by the State, or if the ratings are no longer available, with a comparable rating from a recognized insurance rating agency. All policies of insurance required in this Contract must be issued by companies that have been approved to do business in the State.
See www.michigan.gov/dleg.

Where specific limits are shown, they are the minimum acceptable limits. If Contractor's policy contains higher limits, the State must be entitled to coverage to the extent of the higher limits.

The Contractor is required to pay for and provide the type and amount of insurance checked ☑ below:

☑ 1. Commercial General Liability with the following minimum coverage:

$2,000,000 General Aggregate Limit other than Products/Completed Operations
$2,000,000 Products/Completed Operations Aggregate Limit
$1,000,000 Personal & Advertising Injury Limit
$1,000,000 Each Occurrence Limit

The Contractor must list the State of Michigan, its departments, divisions, agencies, offices, commissions, officers, employees and agents as ADDITIONAL INSUREDS on the Commercial General Liability certificate. The Contractor also agrees to provide evidence that insurance policies contain a waiver of subrogation by the insurance company.

☑ 2. If a motor vehicle is used to provide services or products under this Contract, the Contractor must have vehicle liability insurance on any auto including owned, hired and non-owned vehicles used in Contractor's business for bodily injury and property damage as required by law.

The Contractor must list the State of Michigan, its departments, divisions, agencies, offices, commissions, officers, employees and agents as ADDITIONAL INSUREDS on the vehicle liability certificate. The Contractor also agrees to provide evidence that insurance policies contain a waiver of subrogation by the insurance company.

☑ 3. Workers' compensation coverage must be provided according to applicable laws governing the employees and employers work activities in the state of the Contractor's domicile. If the applicable coverage is provided by a self-insurer, proof must be provided of approved self-insured authority by the jurisdiction of

domicile. For employees working outside of the state of qualification, Contractor must provide appropriate certificates of insurance proving mandated coverage levels for the jurisdictions where the employees' activities occur.

Any certificates of insurance received must also provide a list of states where the coverage is applicable.

The Contractor also agrees to provide evidence that insurance policies contain a waiver of subrogation by the insurance company. This provision must not be applicable where prohibited or limited by the laws of the jurisdiction in which the work is to be performed.

☑ 4. Employers liability insurance with the following minimum limits:

$100,000 each accident
$100,000 each employee by disease
$500,000 aggregate disease

☐ 5. Employee Fidelity, including Computer Crimes, insurance naming the State as a loss payee, providing coverage for direct loss to the State and any legal liability of the State arising out of or related to fraudulent or dishonest acts committed by the employees of Contractor or its Subcontractors, acting alone or in collusion with others, in a minimum amount of one million dollars ($1,000,000.00) with a maximum deductible of fifty thousand dollars ($50,000.00).

☐ 6. Umbrella or Excess Liability Insurance in a minimum amount of ten million dollars ($10,000,000.00), which must apply, at a minimum, to the insurance required in Subsection 1 (Commercial General Liability) above.

☐ 7. Professional Liability (Errors and Omissions) Insurance with the following minimum coverage: three million dollars ($3,000,000.00) each occurrence and three million dollars ($3,000,000.00) annual aggregate.

☐ 8. Fire and Personal Property Insurance covering against any loss or damage to the office space used by Contractor for any reason under this Contract, and the equipment, software and other contents of the office space, including without limitation, those contents used by Contractor to provide the Services to the State, up to its replacement value, where the office space and its contents are under the care, custody and control of Contractor. The policy must cover all risks of direct physical loss or damage, including without limitation, flood and earthquake coverage and coverage for computer hardware and software. The State must be endorsed on the policy as a loss payee as its interests appear.

2.132 Subcontractor Insurance Coverage

Except where the State has approved in writing a Contractor subcontract with other insurance provisions, Contractor must require all of its Subcontractors under this Contract to purchase and maintain the insurance coverage as described in this Section for the Contractor in connection with the performance of work by those Subcontractors. Alternatively, Contractor may include any Subcontractors under Contractor's insurance on the coverage required in this Section. Subcontractor(s) must fully comply with the insurance coverage required in this Section. Failure of Subcontractor(s) to comply with insurance requirements does not limit Contractor's liability or responsibility.

2.133 Certificates of Insurance and Other Requirements

Contractor must furnish to DMB-PurchOps, certificate(s) of insurance verifying insurance coverage or providing satisfactory evidence of self-insurance as required in this Section (the "Certificates"). The Certificate must be on the standard "accord" form or equivalent. **THE CONTRACT OR PURCHASE ORDER NO. MUST BE SHOWN ON THE CERTIFICATE OF INSURANCE TO ASSURE CORRECT FILING.** All Certificate(s) are to be prepared and submitted by the Insurance Provider. All Certificate(s) must contain a provision indicating that coverages afforded under the policies WILL NOT BE CANCELLED, MATERIALLY CHANGED, OR NOT RENEWED without 30 days prior written notice, except for 10 days for non-payment of premium, having been

given to the Director of Purchasing Operations, Department of Management and Budget. The notice must include the Contract or Purchase Order number affected. Before the Contract is signed, and not less than 20 days before the insurance expiration date every year thereafter, the Contractor must provide evidence that the State and its agents, officers and employees are listed as additional insureds under each commercial general liability and commercial automobile liability policy. In the event the State approves the representation of the State by the insurer's attorney, the attorney may be required to be designated as a Special Assistant Attorney General by the Attorney General of the State of Michigan.

The Contractor must maintain all required insurance coverage throughout the term of the Contract and any extensions and, in the case of claims-made Commercial General Liability policies, must secure tail coverage for at least three years following the expiration or termination for any reason of this Contract. The minimum limits of coverage specified above are not intended, and must not be construed, to limit any liability or indemnity of Contractor under this Contract to any indemnified party or other persons. Contractor is responsible for all deductibles with regard to the insurance. If the Contractor fails to pay any premium for required insurance as specified in this Contract, or if any insurer cancels or significantly reduces any required insurance as specified in this Contract without the State's written consent, then the State may, after the State has given the Contractor at least 30 days written notice, pay the premium or procure similar insurance coverage from another company or companies. The State may deduct any part of the cost from any payment due the Contractor, or the Contractor must pay that cost upon demand by the State.

2.140 Indemnification

2.141 General Indemnification

To the extent permitted by law, the Contractor must indemnify, defend and hold harmless the State from liability, including all claims and losses, and all related costs and expenses (including reasonable attorneys' fees and costs of investigation, litigation, settlement, judgments, interest and penalties), accruing or resulting to any person, firm or corporation that may be injured or damaged by the Contractor in the performance of this Contract and that are attributable to the negligence or tortious acts of the Contractor or any of its subcontractors, or by anyone else for whose acts any of them may be liable.

2.142 Code Indemnification

To the extent permitted by law, the Contractor shall indemnify, defend and hold harmless the State from any claim, loss, or expense arising from Contractor's breach of the No Surreptitious Code Warranty.

2.143 Employee Indemnification

In any claims against the State of Michigan, its departments, divisions, agencies, sections, commissions, officers, employees and agents, by any employee of the Contractor or any of its subcontractors, the indemnification obligation under the Contract must not be limited in any way by the amount or type of damages, compensation or benefits payable by or for the Contractor or any of its subcontractors under worker's disability compensation acts, disability benefit acts or other employee benefit acts. This indemnification clause is intended to be comprehensive. Any overlap in provisions, or the fact that greater specificity is provided as to some categories of risk, is not intended to limit the scope of indemnification under any other provisions.

2.144 Patent/Copyright Infringement Indemnification

To the extent permitted by law, the Contractor must indemnify, defend and hold harmless the State from and against all losses, liabilities, damages (including taxes), and all related costs and expenses (including reasonable attorneys' fees and costs of investigation, litigation, settlement, judgments, interest and penalties) incurred in connection with any action or proceeding threatened or brought against the State to the extent that the action or proceeding is based on a claim that any piece of equipment, software, commodity or service supplied by the Contractor or its subcontractors, or the operation of the equipment, software, commodity or service, or the use or reproduction of any documentation provided with the equipment, software, commodity or service infringes any United States patent, copyright, trademark or trade secret of any person or entity, which is enforceable under the laws of the United States.

In addition, should the equipment, software, commodity, or service, or its operation, become or in the State's or Contractor's opinion be likely to become the subject of a claim of infringement, the Contractor must at the Contractor's sole expense (i) procure for the State the right to continue using the equipment, software, commodity or service or, if the option is not reasonably available to the Contractor, (ii) replace or modify to the State's satisfaction the same with equipment, software, commodity or service of equivalent function and performance so that it becomes non-infringing, or, if the option is not reasonably available to Contractor, (iii) accept its return by the State with appropriate credits to the State against the Contractor's charges and reimburse the State for any losses or costs incurred as a consequence of the State ceasing its use and returning it.

Notwithstanding the foregoing, the Contractor has no obligation to indemnify or defend the State for, or to pay any costs, damages or attorneys' fees related to, any claim based upon (i) equipment developed based on written specifications of the State; (ii) use of the equipment in a configuration other than implemented or approved in writing by the Contractor, including, but not limited to, any modification of the equipment by the State; or (iii) the combination, operation, or use of the equipment with equipment or software not supplied by the Contractor under this Contract.

2.145 Continuation of Indemnification Obligations

The Contractor's duty to indemnify under this Section continues in full force and effect, notwithstanding the expiration or early cancellation of the Contract, with respect to any claims based on facts or conditions that occurred before expiration or cancellation.

2.146 Indemnification Procedures

The procedures set forth below must apply to all indemnity obligations under this Contract.

(a) After the State receives notice of the action or proceeding involving a claim for which it will seek indemnification, the State must promptly notify Contractor of the claim in writing and take or assist Contractor in taking, as the case may be, any reasonable action to avoid the imposition of a default judgment against Contractor. No failure to notify the Contractor relieves the Contractor of its indemnification obligations except to the extent that the Contractor can prove damages attributable to the failure. Within 10 days following receipt of written notice from the State relating to any claim, the Contractor must notify the State in writing whether Contractor agrees to assume control of the defense and settlement of that claim (a "Notice of Election"). After notifying Contractor of a claim and before the State receiving Contractor's Notice of Election, the State is entitled to defend against the claim, at the Contractor's expense, and the Contractor will be responsible for any reasonable costs incurred by the State in defending against the claim during that period.

(b) If Contractor delivers a Notice of Election relating to any claim: (i) the State is entitled to participate in the defense of the claim and to employ counsel at its own expense to assist in the handling of the claim and to monitor and advise the State about the status and progress of the defense; (ii) the Contractor must, at the request of the State, demonstrate to the reasonable satisfaction of the State, the Contractor's financial ability to carry out its defense and indemnity obligations under this Contract; (iii) the Contractor must periodically advise the State about the status and progress of the defense and must obtain the prior written approval of the State before entering into any settlement of the claim or ceasing to defend against the claim and (iv) to the extent that any principles of Michigan governmental or public law may be involved or challenged, the State has the right, at its own expense, to control the defense of that portion of the claim involving the principles of Michigan governmental or public law. But the State may retain control of the defense and settlement of a claim by notifying the Contractor in writing within 10 days after the State's receipt of Contractor's information requested by the State under clause (ii) of this paragraph if the State determines that the Contractor has failed to demonstrate to the reasonable satisfaction of the State the Contractor's financial ability to carry out its defense and indemnity obligations under this Section. Any litigation activity on behalf of the State, or any of its subdivisions under this Section, must be coordinated with the Department of Attorney General. In the event the insurer's attorney represents the State under this Section, the insurer's attorney may be required to be designated as a Special Assistant Attorney General by the Attorney General of the State of Michigan.

(c) If Contractor does not deliver a Notice of Election relating to any claim of which it is notified by the State as provided above, the State may defend the claim in the manner as it may deem appropriate, at the cost and expense of Contractor. If it is determined that the claim was one against which Contractor was required to indemnify the State, upon request of the State, Contractor must promptly reimburse the State for all the reasonable costs and expenses.

2.150 Termination/Cancellation

2.151 Notice and Right to Cure

If the Contractor breaches the contract, and the State in its sole discretion determines that the breach is curable, then the State will provide the Contractor with written notice of the breach and a time period (not less than 30 days) to cure the Breach. The notice of breach and opportunity to cure is inapplicable for successive or repeated breaches or if the State determines in its sole discretion that the breach poses a serious and imminent threat to the health or safety of any person or the imminent loss, damage, or destruction of any real or tangible personal property.

2.152 Termination for Cause

(a) The State may terminate this contract, for cause, by notifying the Contractor in writing, if the Contractor (i) breaches any of its material duties or obligations under this Contract (including a Chronic Failure to meet any particular SLA), or (ii) fails to cure a breach within the time period specified in the written notice of breach provided by the State

(b) If this Contract is terminated for cause, the Contractor must pay all costs incurred by the State in terminating this Contract, including but not limited to, State administrative costs, reasonable attorneys' fees and court costs, and any reasonable additional costs the State may incur to procure the Services/Deliverables required by this Contract from other sources. Re-procurement costs are not consequential, indirect or incidental damages, and cannot be excluded by any other terms otherwise included in this Contract, provided the costs are not in excess of 50% more than the prices for the Service/Deliverables provided under this Contract.

(c) If the State chooses to partially terminate this Contract for cause, charges payable under this Contract will be equitably adjusted to reflect those Services/Deliverables that are terminated and the State must pay for all Services/Deliverables for which Final Acceptance has been granted provided up to the termination date. Services and related provisions of this Contract that are terminated for cause must cease on the effective date of the termination.

(d) If the State terminates this Contract for cause under this Section, and it is determined, for any reason, that Contractor was not in breach of contract under the provisions of this section, that termination for cause must be deemed to have been a termination for convenience, effective as of the same date, and the rights and obligations of the parties must be limited to that otherwise provided in this Contract for a termination for convenience.

2.153 Termination for Convenience

The State may terminate this Contract for its convenience, in whole or part, if the State determines that a termination is in the State's best interest. Reasons for the termination must be left to the sole discretion of the State and may include, but not necessarily be limited to (a) the State no longer needs the Services or products specified in the Contract, (b) relocation of office, program changes, changes in laws, rules, or regulations make implementation of the Services no longer practical or feasible, (c) unacceptable prices for Additional Services or New Work requested by the State, or (d) falsification or misrepresentation, by inclusion or non-inclusion, of information material to a response to any RFP issued by the State. The State may terminate this Contract for its convenience, in whole or in part, by giving Contractor written notice at least 30 days before the date of termination. If the State chooses to terminate this Contract in part, the charges payable under this Contract must be equitably adjusted to reflect those Services/Deliverables that are terminated. Services and related provisions of this Contract that are terminated for cause must cease on the effective date of the termination.

2.154 Termination for Non-Appropriation

(a) Contractor acknowledges that, if this Contract extends for several fiscal years, continuation of this Contract is subject to appropriation or availability of funds for this Contract. If funds to enable the State to effect continued payment under this Contract are not appropriated or otherwise made available, the State must terminate this Contract and all affected Statements of Work, in whole or in part, at the end of the last period for which funds have been appropriated or otherwise made available by giving written notice of termination to Contractor. The State must give Contractor at least 30 days advance written notice of termination for non-appropriation or unavailability (or the time as is available if the State receives notice of the final decision less than 30 days before the funding cutoff).

(b) If funding for the Contract is reduced by law, or funds to pay Contractor for the agreed-to level of the Services or production of Deliverables to be provided by Contractor are not appropriated or otherwise unavailable, the State may, upon 30 days written notice to Contractor, reduce the level of the Services or the change the production of Deliverables in the manner and for the periods of time as the State may elect. The charges payable under this Contract will be equitably adjusted to reflect any equipment, services or commodities not provided by reason of the reduction.

(c) If the State terminates this Contract, eliminates certain Deliverables, or reduces the level of Services to be provided by Contractor under this Section, the State must pay Contractor for all Work-in-Process performed through the effective date of the termination or reduction in level, as the case may be and as determined by the State, to the extent funds are available. This Section will not preclude Contractor from reducing or stopping Services/Deliverables or raising against the State in a court of competent jurisdiction, any claim for a shortfall in payment for Services performed or Deliverables finally accepted before the effective date of termination.

2.155 Termination for Criminal Conviction

The State may terminate this Contract immediately and without further liability or penalty in the event Contractor, an officer of Contractor, or an owner of a 25% or greater share of Contractor is convicted of a criminal offense related to a State, public or private Contract or subcontract.

2.156 Termination for Approvals Rescinded

The State may terminate this Contract if any final administrative or judicial decision or adjudication disapproves a previously approved request for purchase of personal services under Constitution 1963, Article 11, § 5, and Civil Service Rule 7-1. In that case, the State will pay the Contractor for only the work completed to that point under the Contract. Termination may be in whole or in part and may be immediate as of the date of the written notice to Contractor or may be effective as of the date stated in the written notice.

2.157 Rights and Obligations upon Termination

(a) If the State terminates this Contract for any reason, the Contractor must (a) stop all work as specified in the notice of termination, (b) take any action that may be necessary, or that the State may direct, for preservation and protection of Deliverables or other property derived or resulting from this Contract that may be in Contractor's possession, (c) return all materials and property provided directly or indirectly to Contractor by any entity, agent or employee of the State, (d) transfer title in, and deliver to, the State, unless otherwise directed, all Deliverables intended to be transferred to the State at the termination of the Contract and which are resulting from the Contract (which must be provided to the State on an "As-Is" basis except to the extent the amounts paid by the State in respect of the items included compensation to Contractor for the provision of warranty services in respect of the materials), and (e) take any action to mitigate and limit any potential damages, or requests for Contractor adjustment or termination settlement costs, to the maximum practical extent, including terminating or limiting as otherwise applicable those subcontracts and outstanding orders for material and supplies resulting from the terminated Contract.

(b) If the State terminates this Contract before its expiration for its own convenience, the State must pay Contractor for all charges due for Services provided before the date of termination and, if applicable, as a separate item of payment under this Contract, for Work In Process, on a percentage of completion basis at the level of completion determined by the State. All completed or partially completed Deliverables prepared by Contractor under this Contract, at the option of the State, becomes the State's property, and Contractor is entitled to receive equitable fair compensation for the Deliverables. Regardless of the basis for the termination, the State is not obligated to pay, or otherwise compensate, Contractor for any lost expected future profits, costs or expenses incurred with respect to Services not actually performed for the State.

(c) Upon a good faith termination, the State may assume, at its option, any subcontracts and agreements for services and deliverables provided under this Contract, and may further pursue completion of the Services/Deliverables under this Contract by replacement contract or otherwise as the State may in its sole judgment deem expedient.

2.158 Reservation of Rights

Any termination of this Contract or any Statement of Work issued under it by a party must be with full reservation of, and without prejudice to, any rights or remedies otherwise available to the party with respect to any claims arising before or as a result of the termination.

2.160 Termination by Contractor – Deleted – Not Applicable

2.170 Transition Responsibilities

2.171 Contractor Transition Responsibilities

If the State terminates this contract, for convenience or cause, or if the Contract is otherwise dissolved, voided, rescinded, nullified, expires or rendered unenforceable, the Contractor agrees to comply with direction provided by the State to assist in the orderly transition of equipment, services, software, leases, etc. to the State or a third party designated by the State. If this Contract expires or terminates, the Contractor agrees to make all reasonable efforts to effect an orderly transition of services within a reasonable period of time that in no event will exceed 120 days. These efforts must include, but are not limited to, those listed in **Sections 2.141, 2.142, 2.143, 2.144, and 2.145.**

2.172 Contractor Personnel Transition

The Contractor must work with the State, or a specified third party, to develop a transition plan setting forth the specific tasks and schedule to be accomplished by the parties, to effect an orderly transition. The Contractor must allow as many personnel as practicable to remain on the job to help the State, or a specified third party, maintain the continuity and consistency of the services required by this Contract. In addition, during or following the transition period, in the event the State requires the Services of the Contractor's subcontractors or vendors, as necessary to meet its needs, Contractor agrees to reasonably, and with good-faith, work with the State to use the Services of Contractor's subcontractors or vendors. Contractor will notify all of Contractor's subcontractors of procedures to be followed during transition.

2.173 Contractor Information Transition

The Contractor agrees to provide reasonable detailed specifications for all Services/Deliverables needed by the State, or specified third party, to properly provide the Services/Deliverables required under this Contract. The Contractor will provide the State with asset management data generated from the inception of this Contract through the date on which this Contractor is terminated in a comma-delineated format unless otherwise requested by the State. The Contractor will deliver to the State any remaining owed reports and documentation still in Contractor's possession subject to appropriate payment by the State.

2.174 Contractor Software Transition

The Contractor must reasonably assist the State in the acquisition of any Contractor software required to perform the Services/use the Deliverables under this Contract. This must include any documentation being used by the Contractor to perform the Services under this Contract. If the State transfers any software licenses to the Contractor, those licenses must, upon expiration of the Contract, transfer back to the State at their current revision level. Upon notification by the State, Contractor may be required to freeze all non-critical changes to Deliverables/Services.

2.175 Transition Payments

If the transition results from a termination for any reason, reimbursement must be governed by the termination provisions of this Contract. If the transition results from expiration, the Contractor will be reimbursed for all reasonable transition costs (i.e. costs incurred within the agreed period after contract expiration that result from transition operations) at the rates agreed upon by the State. The Contractor will prepare an accurate accounting from which the State and Contractor may reconcile all outstanding accounts.

2.176 State Transition Responsibilities

In the event that this Contract is terminated, dissolved, voided, rescinded, nullified, or otherwise rendered unenforceable, the State agrees to perform the following obligations, and any others upon which the State and the Contractor agree:

(a) Reconciling all accounts between the State and the Contractor;

(b) Completing any pending post-project reviews.

2.180 Stop Work

2.181 Stop Work Orders

The State may, at any time, by written stop work order to Contractor, require that Contractor stop all, or any part, of the work called for by the Contract for a period of up to 90 calendar days after the stop work order is delivered to Contractor, and for any further period to which the parties may agree. The stop work order must be identified as a stop work order and must indicate that it is issued under this **Section 2.150**. Upon receipt of the stop work order, Contractor must immediately comply with its terms and take all reasonable steps to minimize incurring costs allocable to the work covered by the stop work order during the period of work stoppage. Within the period of the stop work order, the State must either: (a) cancel the stop work order; or (b) terminate the work covered by the stop work order as provided in **Section 2.130**.

2.182 Cancellation or Expiration of Stop Work Order

The Contractor must resume work if the State cancels a Stop Work Order or if it expires. The parties will agree upon an equitable adjustment in the delivery schedule, the Contract price, or both, and the Contract must be modified, in writing, accordingly, if: (a) the stop work order results in an increase in the time required for, or in Contractor's costs properly allocable to, the performance of any part of the Contract; and (b) Contractor asserts its right to an equitable adjustment within 30 calendar days after the end of the period of work stoppage; provided that, if the State decides the facts justify the action, the State may receive and act upon a Contractor proposal submitted at any time before final payment under the Contract. Any adjustment will conform to the requirements of **Section 2.024**.

2.183 Allowance of Contractor Costs

If the stop work order is not canceled and the work covered by the stop work order is terminated for reasons other than material breach, the termination must be deemed to be a termination for convenience under **Section 2.130**, and the State will pay reasonable costs resulting from the stop work order in arriving at the termination settlement. For the avoidance of doubt, the State is not be liable to Contractor for loss of profits because of a stop work order issued under this **Section 2.150.**

2.190 Dispute Resolution

2.191 In General

Any claim, counterclaim, or dispute between the State and Contractor arising out of or relating to the Contract or any Statement of Work must be resolved as follows. For all Contractor claims seeking an increase in the amounts payable to Contractor under the Contract, or the time for Contractor's performance, Contractor must submit a letter, together with all data supporting the claims, executed by Contractor's Contract Administrator or the Contract Administrator's designee certifying that (a) the claim is made in good faith, (b) the amount claimed accurately reflects the adjustments in the amounts payable to Contractor or the time for Contractor's performance for which Contractor believes the State is liable and covers all costs of every type to which Contractor is entitled from the occurrence of the claimed event, and (c) the claim and the supporting data are current and complete to Contractor's best knowledge and belief.

2.192 Informal Dispute Resolution

(a) All disputes between the parties must be resolved under the Contract Management procedures in this Contract. If the parties are unable to resolve any disputes after compliance with the processes, the parties must meet with the Director of Purchasing Operations, DMB, or designee, for the purpose of attempting to resolve the dispute without the need for formal legal proceedings, as follows:

(i) The representatives of Contractor and the State must meet as often as the parties reasonably deem necessary to gather and furnish to each other all information with respect to the matter in issue which the parties believe to be appropriate and germane in connection with its resolution. The representatives must discuss the problem and negotiate in good faith in an effort to resolve the dispute without the necessity of any formal proceeding.

(ii) During the course of negotiations, all reasonable requests made by one party to another for non-privileged information reasonably related to the Contract will be honored in order that each of the parties may be fully advised of the other's position.

(iii) The specific format for the discussions will be left to the discretion of the designated State and Contractor representatives, but may include the preparation of agreed upon statements of fact or written statements of position.

(iv) Following the completion of this process within 60 calendar days, the Director of Purchasing Operations, DMB, or designee, must issue a written opinion regarding the issue(s) in dispute within 30 calendar days. The opinion regarding the dispute must be considered the State's final action and the exhaustion of administrative remedies.

(b) This Section will not be construed to prevent either party from instituting, and a party is authorized to institute, formal proceedings earlier to avoid the expiration of any applicable limitations period, to preserve a superior position with respect to other creditors, or under **Section 2.163**.

(c) The State will not mediate disputes between the Contractor and any other entity, except state agencies, concerning responsibility for performance of work under the Contract.

2.193 Injunctive Relief

The only circumstance in which disputes between the State and Contractor will not be subject to the provisions of **Section 2.162** is where a party makes a good faith determination that a breach of the terms of the Contract by the other party is the that the damages to the party resulting from the breach will be so immediate, so large or severe and so incapable of adequate redress after the fact that a temporary restraining order or other immediate injunctive relief is the only adequate remedy.

2.194 Continued Performance

Each party agrees to continue performing its obligations under the Contract while a dispute is being resolved except to the extent the issue in dispute precludes performance (dispute over payment must not be deemed to preclude performance) and without limiting either party's right to terminate the Contract as provided in **Section 2.150**, as the case may be.

2.200 Federal and State Contract Requirements

2.201 Nondiscrimination

In the performance of the Contract, Contractor agrees not to discriminate against any employee or applicant for employment, with respect to his or her hire, tenure, terms, conditions or privileges of employment, or any matter directly or indirectly related to employment, because of race, color, religion, national origin, ancestry, age, sex, height, weight, marital status, physical or mental disability. Contractor further agrees that every subcontract entered into for the performance of this Contract or any purchase order resulting from this Contract will contain a provision requiring non-discrimination in employment, as specified here, binding upon each Subcontractor. This covenant is required under the Elliot Larsen Civil Rights Act, 1976 PA 453, MCL 37.2101, et seq., and the Persons with Disabilities Civil Rights Act, 1976 PA 220, MCL 37.1101, et seq., and any breach of this provision may be regarded as a material breach of the Contract.

2.202 Unfair Labor Practices

Under 1980 PA 278, MCL 423.321, et seq., the State must not award a Contract or subcontract to an employer whose name appears in the current register of employers failing to correct an unfair labor practice compiled under section 2 of the Act. This information is compiled by the United States National Labor Relations Board. A Contractor of the State, in relation to the Contract, must not enter into a contract with a Subcontractor, manufacturer, or supplier whose name appears in this register. Under section 4 of 1980 PA 278, MCL 423.324, the State may void any Contract if, after award of the Contract, the name of Contractor as an employer or the name of the Subcontractor, manufacturer or supplier of Contractor appears in the register.

2.203 Workplace Safety and Discriminatory Harassment

In performing Services for the State, the Contractor must comply with the Department of Civil Services Rule 2-20 regarding Workplace Safety and Rule 1-8.3 regarding Discriminatory Harassment. In addition, the Contractor must comply with Civil Service regulations and any applicable agency rules provided to the Contractor. For Civil Service Rules, see http://www.mi.gov/mdcs/0,1607,7-147-6877---,00.html.

2.210 Governing Law

2.211 Governing Law

The Contract must in all respects be governed by, and construed according to, the substantive laws of the State of Michigan without regard to any Michigan choice of law rules that would apply the substantive law of any other jurisdiction to the extent not inconsistent with, or pre-empted by federal law.

2.212 Compliance with Laws

Contractor shall comply with all applicable state, federal and local laws and ordinances in providing the Services/Deliverables.

2.213 Jurisdiction

Any dispute arising from the Contract must be resolved in the State of Michigan. With respect to any claim between the parties, Contractor consents to venue in Ingham County, Michigan, and irrevocably waives any objections it may have to the jurisdiction on the grounds of lack of personal jurisdiction of the court or the laying of venue of the court or on the basis of forum non conveniens or otherwise. Contractor agrees to appoint agents in the State of Michigan to receive service of process.

2.214 Applicable Statutes

The following statutes, rules, and laws are applicable to the performance of this contract; some statutes are reflected in the clauses of this contract. This list is NOT exhaustive.

All applicable Federal Motor Vehicle Safety Standards
All applicable Michigan Motor Carrier Vehicle Codes
Michigan Consumer Protection Act MCL §§ 445.901-445.922
Michigan Uniform Commercial Code (MIUCC) MCL 440 (All section unless otherwise althered by agreement)
Michigan OSHA MCL §§ 408.1001 – 408.1094
Laws relating to wages, payments of wages, and fringe benefits on state projects MCL §§ 408.551-408.558, 408.471-408.490, 1965 PA 390.
Contract Work Hours and Safety Standards Act (CWHSAA) 40 USCS § 327, et seq.
Rules and regulations of the Equal Employment Opportunity Commission (EEOC)
The Civil Rights Act of 1964, USCS Chapter 42
Elliot Larsen Civil Rights Act MCL §§ 37.2201, et seq.
Department of Civil Service rules and regulations
Persons with disabilities Civil Rights Act MCL §§ 37.11.01, et seq.
The Americans with Disabilities Act (ADA), 43 USCS §§ 12101 et seq.
Business Opportunity Act for Persons with Disabilities MCL §§ 450.791-450.795
The Age Discrimination in Employment Act of 1967 (ADEA), 29 USCS §§ 621, 623 et seq.
The Old Workers Benefit and Protection Act of 1990 (OWBPA), 29 USCS §§ 626, et seq.
The Family Medical Leave Act of 1993 (FMLA), 29 USC §§ 651 et seq.
The Fair Labor Standards Act (FLSA), 29 USC §§ 651 et seq.
Title VII, 42 USCS §§ 2000e et seq.
MCL §§ 423.321, et seq.
MCL § 18.1264 (law regarding debarment)
Internal Revenue Code
Rules and regulations of the Environmental Protection Agency
Natural Resources and Environmental Protection Act MCL §§ 324.101, et seq.
Pollution Prevention Act of 1990 (PPA) 42 USC § 13106
Sherman Act, 15 USCS § 1 et seq.
Robinson-Patman Act, 15 USCS § 13 et seq.
Clayton Act, 15 USCS § 14 et seq.
Freedom of Information Act (FIOA) MCL §§ 15.231, et seq.
Davis-Bacon Act (DBA) 40 USCU §§ 37276(a), et seq.
FTA Clauses (Rolling Stock), 49 U.S.C. 5323(j) and 49 CFR Part 661 (COPY ATTACHED – SEE APPENDIX C).

2.220 Limitation of Liability

2.221 Limitation of Liability

Neither the Contractor nor the State is liable to each other, regardless of the form of action, for consequential, incidental, indirect, or special damages. This limitation of liability does not apply to claims for infringement of United States patent, copyright, trademark or trade secrets; to claims for personal injury or damage to property caused by the gross negligence or willful misconduct of the Contractor; to claims covered by other specific provisions of this Contract calling for liquidated damages; or to court costs or attorney's fees awarded by a court in addition to damages after litigation based on this Contract.

The State's liability for damages to the Contractor is limited to the value of the Contract.

2.230 Disclosure Responsibilities

2.231 Disclosure of Litigation

(a) Disclosure. Contractor must disclose any material criminal litigation, investigations or proceedings involving the Contractor (and each Subcontractor) or any of its officers or directors or any litigation, investigations or proceedings under the Sarbanes-Oxley Act. In addition, each Contractor (and each Subcontractor) must notify

the State of any material civil litigation, arbitration or proceeding which arises during the term of the Contract and extensions, to which Contractor (or, to the extent Contractor is aware, any Subcontractor) is a party, and which involves: (i) disputes that might reasonably be expected to adversely affect the viability or financial stability of Contractor or any Subcontractor; or (ii) a claim or written allegation of fraud against Contractor or, to the extent Contractor is aware, any Subcontractor by a governmental or public entity arising out of their business dealings with governmental or public entities. The Contractor must disclose in writing to the Contract Administrator any litigation, investigation, arbitration or other proceeding (collectively, "Proceeding") within 30 days of its occurrence. Details of settlements which are prevented from disclosure by the terms of the settlement may be annotated. Information provided to the State from Contractor's publicly filed documents referencing its material litigation will be deemed to satisfy the requirements of this Section.

(b) Assurances. If any Proceeding disclosed to the State under this Section, or of which the State otherwise becomes aware, during the term of this Contract would cause a reasonable party to be concerned about:

(i) the ability of Contractor (or a Subcontractor) to continue to perform this Contract according to its terms and conditions, or

(ii) whether Contractor (or a Subcontractor) in performing Services for the State is engaged in conduct which is similar in nature to conduct alleged in the Proceeding, which conduct would constitute a breach of this Contract or a violation of Michigan law, regulations or public policy, then the Contractor must provide the State all reasonable assurances requested by the State to demonstrate that:

(a) Contractor and its Subcontractors will be able to continue to perform this Contract and any Statements of Work according to its terms and conditions, and

(b) Contractor and its Subcontractors have not and will not engage in conduct in performing the Services which is similar in nature to the conduct alleged in the Proceeding.

(c) Contractor must make the following notifications in writing:

(1) Within 30 days of Contractor becoming aware that a change in its ownership or officers has occurred, or is certain to occur, or a change that could result in changes in the valuation of its capitalized assets in the accounting records, Contractor must notify DMB Purch-Ops.

(2) Contractor must also notify DMB Purch-Ops within 30 days whenever changes to asset valuations or any other cost changes have occurred or are certain to occur as a result of a change in ownership or officers.

(3) Contractor must also notify DMB Purch-Ops within 30 days whenever changes to company affiliations occur.

2.232 Call Center Disclosure

Deleted – Not Applicable

2.233 Bankruptcy

The State may, without prejudice to any other right or remedy, terminate this Contract, in whole or in part, and, at its option, may take possession of the "Work in Process" and finish the Works in Process by whatever appropriate method the State may deem expedient if:

(a) the Contractor files for protection under the bankruptcy laws;

(b) an involuntary petition is filed against the Contractor and not removed within 30 days;

(c) the Contractor becomes insolvent or if a receiver is appointed due to the Contractor's insolvency;

(d) the Contractor makes a general assignment for the benefit of creditors; or

(e) the Contractor or its affiliates are unable to provide reasonable assurances that the Contractor or its affiliates can deliver the services under this Contract.

Contractor will fix appropriate notices or labels on the Work in Process to indicate ownership by the State. To the extent reasonably possible, materials and Work in Process must be stored separately from other stock and marked conspicuously with labels indicating ownership by the State.

2.240 Performance

2.241 Time of Performance

(a) Contractor must use commercially reasonable efforts to provide the resources necessary to complete all Services and Deliverables according to the time schedules contained in the Statements of Work and other Exhibits governing the work, and with professional quality.

(b) Without limiting the generality of **Section 2.211(a),** Contractor must notify the State in a timely manner upon becoming aware of any circumstances that may reasonably be expected to jeopardize the timely and successful completion of any Deliverables/Services on the scheduled due dates in the latest State-approved delivery schedule and must inform the State of the projected actual delivery date.

(c) If the Contractor believes that a delay in performance by the State has caused or will cause the Contractor to be unable to perform its obligations according to specified Contract time periods, the Contractor must notify the State in a timely manner and must use commercially reasonable efforts to perform its obligations according to the Contract time periods notwithstanding the State's failure. Contractor will not be in default for a delay in performance to the extent the delay is caused by the State.

2.242 Service Level Agreements (SLAs)

Deleted – Not Applicable

2.243 Liquidated Damages

A. The Michigan Department of Transportation, Bureau of Passenger Transportation; Authorized Local Units of Government, and Public Transit Agencies and the Contractor hereby agree to the specific standards set forth in this Contract. It is agreed between the Contractor and the Michigan Department of Transportation, Bureau of Passenger Transportation; Authorized Local Units of Government, and Public Transit Agencies that the actual damages to the Michigan Department of Transportation, Bureau of Passenger Transportation; Authorized Local Units of Government, and Public Transit Agencies as a result of Contractor's failure to provide promised services would be difficult or impossible to determine with accuracy. The Michigan Department of Transportation, Bureau of Passenger Transportation; Authorized Local Units of Government, and Public Transit Agencies and the Contractor therefore agree that liquidated damages as set out herein shall be a reasonable approximation of the damages that shall be suffered by the Michigan Department of Transportation, Bureau of Passenger Transportation; Authorized Local Units of Government, and Public Transit Agencies as a result thereof. Accordingly, in the event of such damages, at the written direction of the Michigan Department of Transportation, Bureau of Passenger Transportation; Authorized Local Units of Government, and Public Transit Agencies the indicated amount as liquidated damages, and not as a penalty. Amounts due the Michigan Department of Transportation, Bureau of Passenger Transportation; Authorized Local Units of Government, and Public Transit Agencies as liquidated damages, if not paid by the Contractor within fifteen (15) days of notification of assessment, may be deducted by the Michigan Department of Transportation, Bureau of Passenger Transportation; Authorized Local Units of Government, and Public Transit Agencies from any money payable to the Contractor pursuant to this Contract. The Michigan Department of Transportation, Bureau of Passenger Transportation; Authorized Local Units of Government, and Public Transit Agencies will notify the Contractor in writing of any claim for liquidated damages pursuant to this paragraph on or before the date the Michigan Department of Transportation, Bureau of Passenger Transportation; Authorized Local Units of Government, and Public Transit Agencies deducts such sums from money payable to the Contractor. No delay by the Michigan Department of Transportation, Bureau of Passenger Transportation; Authorized Local Units of Government, and Public Transit Agencies in assessing or collecting liquidated damages shall be construed as a waiver of such rights.

B. The Contractor shall not be liable for liquidated damages when, in the opinion of the M Michigan Department of Transportation, Bureau of Passenger Transportation; Authorized Local Units of Government, and Public Transit Agencies, incidents or delays result directly from causes beyond the control and without the fault or negligence of the Contractor. Such causes may include, but are not restricted to, acts of God, fires, floods, epidemics, and labor unrest; but in every case the delays must be beyond the control and without the fault or negligence of the Contractor.

C. Liquidated damages will be assessed as follows:

If the contractor does not deliver the vehicle/s, ready for use on or before the scheduled delivery date, the contractor shall pay to the State and/or Local Unit of Government, as fixed and agreed, liquidated damages, for each calendar day between the delivery date specified and the date of final delivery, but not more than 30 calendar days in lieu of all other damages due to such non-delivery, an amount of 1/10th of 1% of the Purchase Order/Departmental Contract Release Form unit cost per vehicle.

If some, but not all, of the vehicle/s described in the Purchase Order/Departmental Contract Release Form are delivered ready for use, by the scheduled delivery date, liquidated damages shall not accrue against the vehicle/s delivered.

If the delay is more than thirty 30 calendar days, then by written notice to the Contractor, the State and/or Local Unit of Government may terminate the right of the contractor to deliver, and may obtain substitute vehicle/s. In this event, the Contractor shall be liable for liquidated damages in the amounts specified above until acceptable substitute vehicle/s are delivered, ready for use, or for 30 days from the scheduled delivery date, whichever occurs first.

2.244 Excusable Failure

Neither party will be liable for any default, damage or delay in the performance of its obligations under the Contract to the extent the default, damage or delay is caused by government regulations or requirements (executive, legislative, judicial, military or otherwise), power failure, electrical surges or current fluctuations, lightning, earthquake, war, water or other forces of nature or acts of God, delays or failures of transportation, equipment shortages, suppliers' failures, or acts or omissions of common carriers, fire; riots, civil disorders; strikes or other labor disputes, embargoes; injunctions (provided the injunction was not issued as a result of any fault or negligence of the party seeking to have its default or delay excused); or any other cause beyond the reasonable control of a party; provided the non-performing party and its Subcontractors are without fault in causing the default or delay, and the default or delay could not have been prevented by reasonable precautions and cannot reasonably be circumvented by the non-performing party through the use of alternate sources, workaround plans or other means, including disaster recovery plans.

If a party does not perform its contractual obligations for any of the reasons listed above, the non-performing party will be excused from any further performance of its affected obligation(s) for as long as the circumstances prevail. But the party must use commercially reasonable efforts to recommence performance whenever and to whatever extent possible without delay. A party must promptly notify the other party in writing immediately after the excusable failure occurs, and also when it abates or ends.

If any of the above-enumerated circumstances substantially prevent, hinder, or delay the Contractor's performance of the Services/provision of Deliverables for more than 10 Business Days, and the Michigan Department of Transportation, Bureau of Passenger Transportation; authorized local units of government; and public transit agencies determines that performance is not likely to be resumed within a period of time that is satisfactory to the Michigan Department of Transportation, Bureau of Passenger Transportation; authorized local units of government; and public transit agencies in its reasonable discretion, then at the State's option: (a) the State may procure the affected Services/Deliverables from an alternate source, and the State, authorized local units of government, and public transit agencies are not be liable for payment for the unperformed Services/ Deliverables not provided under

the Contract for so long as the delay in performance continues; (b) the State may terminate any portion of the Contract so affected and the charges payable will be equitably adjusted to reflect those Services/Deliverables terminated; or (c) the State may terminate the affected Statement of Work without liability to Contractor as of a date specified by the State in a written notice of termination to the Contractor, except to the extent that the State must pay for Services/Deliverables provided through the date of termination.

The Contractor will not have the right to any additional payments from the State, authorized local units of government, and public transit agencies as a result of any Excusable Failure occurrence or to payments for Services not rendered/Deliverables not provided as a result of the Excusable Failure condition. Defaults or delays in performance by Contractor which are caused by acts or omissions of its Subcontractors will not relieve Contractor of its obligations under the Contract except to the extent that a Subcontractor is itself subject to an Excusable Failure condition described above and Contractor cannot reasonably circumvent the effect of the Subcontractor's default or delay in performance through the use of alternate sources, workaround plans or other means.

2.250 Approval of Deliverables

2.251 Delivery Responsibilities

Unless otherwise specified by the Michigan Department of Transportation, Bureau of Passenger Transportation; authorized local units of government; and public transit agencies within an individual order, the following must be applicable to all orders issued under this Contract.

(a) Shipment responsibilities - Services performed/Deliverables provided under this Contract must be delivered "F.O.B. Destination." The Contractor must have complete responsibility for providing all Services/Deliverables to all site(s) unless otherwise stated. Actual delivery dates will be specified on the individual purchase order.
(b) Delivery locations - Services will be performed/Deliverables will be provided at every authorized local units of government, public transit agencies, or State locations within Michigan unless otherwise stated in the SOW. Specific locations will be provided by upon issuance of individual purchase orders.
(c) Damage Disputes - At the time of delivery to local units of government, public transit agencies, or State Locations, the local units of government, public transit agencies, or State must examine all packages. The quantity of buses delivered must be recorded and any obvious visible or suspected damage must be noted at time of delivery using the shipper's delivery document(s) and appropriate procedures to record the damage.
Where there is no obvious or suspected damage, all deliveries to a local unit of government, public transit agency, or State Location must be opened by the local units of government, public transit agencies, or State and the contents inspected for possible internal damage not visible externally within 14 days of receipt. Any damage must be reported to the Contractor within five days of inspection.

2.252 Delivery of Deliverables

Where applicable, the Statements of Work/POs contain lists of the Deliverables to be prepared and delivered by Contractor including, for each Deliverable, the scheduled delivery date and a designation of whether the Deliverable is a document ("Written Deliverable"), a good ("Physical Deliverable") or a Service. All Deliverables must be completed and delivered for State review and written approval and, where applicable, installed according to the State-approved delivery schedule and any other applicable terms and conditions of the Contract.

2.253 Testing

(a) Before delivering any of the above-mentioned Statement of Work Physical Deliverables or Services to the Michigan Department of Transportation, Bureau of Passenger Transportation, Contractor will first perform all required quality assurance activities to verify that the Physical Deliverable or Service is complete and conforms with its specifications listed in the applicable Statement of Work or Purchase Order. Before delivering a Physical Deliverable or Service to the Michigan Department of Transportation, Bureau of Passenger Transportation; local units of government; or public transit agencies, Contractor must certify to the Michigan Department of Transportation, Bureau of Passenger Transportation; authorized local units of government; and public transit agencies that (1) it has performed the quality assurance activities, (2) it has performed any applicable testing, (3) it

has corrected all material deficiencies discovered during the quality assurance activities and testing, (4) the Deliverable or Service is in a suitable state of readiness for the State's review and approval, and (5) the Deliverable/Service has all Critical Security patches/updates applied.

(b) If a Deliverable includes installation at a local unit of government, public transit agency, or State Location, then Contractor must (1) perform any applicable testing, (2) correct all material deficiencies discovered during the quality assurance activities and testing, and (3) inform the State that the Deliverable is in a suitable state of readiness for the State's review and approval. To the extent that testing occurs at local unit of government, public transit agency, or State Locations, the Michigan Department of Transportation, Bureau of Passenger Transportation; authorized local units of government; and public transit agencies are entitled to observe or otherwise participate in testing.

2.254 Approval of Deliverables, In General

(a) All Deliverables (Physical Deliverables and Written Deliverables) and Services require formal written approval by the State, according to the following procedures. Formal approval by the State requires the State to confirm in writing that the Deliverable meets its specifications. Formal approval may include the successful completion of Testing as applicable in **Section 2.253**, to be led by the State with the support and assistance of Contractor. The approval process will be facilitated by ongoing consultation between the parties, inspection of interim and intermediate Deliverables and collaboration on key decisions.

(b) The State's obligation to comply with any State Review Period is conditioned on the timely delivery of Deliverables/Services being reviewed.

(c) Before commencement of its review or testing of a Deliverable/Service, the State may inspect the Deliverable/Service to confirm that all components of the Deliverable/Service have been delivered without material deficiencies. If the State determines that the Deliverable/Service has material deficiencies, the State may refuse delivery of the Deliverable/Service without performing any further inspection or testing of the Deliverable/Service. Otherwise, the review period will be deemed to have started on the day the State receives the Deliverable or the Service begins, and the State and Contractor agree that the Deliverable/Service is ready for use and, where applicable, certification by Contractor according to **Section 2.223**.

(d) The State will approve in writing a Deliverable/Service after confirming that it conforms to and performs according to its specifications without material deficiency. The State may, but is not be required to, conditionally approve in writing a Deliverable/Service that contains material deficiencies if the State elects to permit Contractor to rectify them post-approval. In any case, Contractor will be responsible for working diligently to correct within a reasonable time at Contractor's expense all deficiencies in the Deliverable/Service that remain outstanding at the time of State approval.

(e) If, after three opportunities (the original and two repeat efforts), the Contractor is unable to correct all deficiencies preventing Final Acceptance of a Deliverable/Service, the State may: (i) demand that the Contractor cure the failure and give the Contractor additional time to cure the failure at the sole expense of the Contractor; or (ii) keep the Contract in force and do, either itself or through other parties, whatever the Contractor has failed to do, and recover the difference between the cost to cure the deficiency and the contract price plus an additional sum equal to 10% of the cost to cure the deficiency to cover the State's general expenses provided the State can furnish proof of the general expenses; or (iii) terminate the particular Statement of Work for default, either in whole or in part by notice to Contractor provided Contractor is unable to cure the breach. Notwithstanding the foregoing, the State cannot use, as a basis for exercising its termination rights under this Section, deficiencies discovered in a repeat State Review Period that could reasonably have been discovered during a prior State Review Period.

(f) The State, at any time and in its reasonable discretion, may halt the testing or approval process if the process reveals deficiencies in or problems with a Deliverable/Service in a sufficient quantity or of a sufficient severity that renders continuing the process unproductive or unworkable. If that happens, the State may stop using the Service or return the applicable Deliverable to Contractor for correction and re-delivery before resuming the testing or approval process.

2.255 Process For Approval of Written Deliverables

The State Review Period for Written Deliverables will be the number of days set forth in the applicable Statement of Work following delivery of the final version of the Deliverable (and if the Statement of Work does not state the State Review Period, it is by default five Business Days for Written Deliverables of 100 pages or less and 10 Business Days for Written Deliverables of more than 100 pages). The duration of the State Review Periods will be doubled if the State has not had an opportunity to review an interim draft of the Written Deliverable before its submission to the State. The State agrees to notify Contractor in writing by the end of the State Review Period either stating that the Deliverable is approved in the form delivered by Contractor or describing any deficiencies that must be corrected before approval of the Deliverable (or at the State's election, after approval of the Deliverable). If the State notifies the Contractor about deficiencies, the Contractor will correct the described deficiencies and within 30 Business Days resubmit the Deliverable in a form that shows all revisions made to the original version delivered to the State. Contractor's correction efforts will be made at no additional charge. Upon receipt of a corrected Deliverable from Contractor, the State will have a reasonable additional period of time, not to exceed the length of the original State Review Period, to review the corrected Deliverable to confirm that the identified deficiencies have been corrected.

2.256 Process for Approval of Services

The State Review Period for approval of Services is governed by the applicable Statement of Work (and if the Statement of Work does not state the State Review Period, it is by default 30 Business Days for Services). The State agrees to notify the Contractor in writing by the end of the State Review Period either stating that the Service is approved in the form delivered by the Contractor or describing any deficiencies that must be corrected before approval of the Services (or at the State's election, after approval of the Service). If the State delivers to the Contractor a notice of deficiencies, the Contractor will correct the described deficiencies and within 30 Business Days resubmit the Service in a form that shows all revisions made to the original version delivered to the State. The Contractor's correction efforts will be made at no additional charge. Upon implementation of a corrected Service from Contractor, the State will have a reasonable additional period of time, not to exceed the length of the original State Review Period, to review the corrected Service for conformity and that the identified deficiencies have been corrected.

2.257 Process for Approval of Physical Deliverables

The State Review Period for approval of Physical Deliverables is governed by the applicable Statement of Work (and if the Statement of Work does not state the State Review Period, it is by default 30 continuous Business Days for a Physical Deliverable). The State agrees to notify the Contractor in writing by the end of the State Review Period either stating that the Deliverable is approved in the form delivered by the Contractor or describing any deficiencies that must be corrected before approval of the Deliverable (or at the State's election, after approval of the Deliverable). If the State delivers to the Contractor a notice of deficiencies, the Contractor will correct the described deficiencies and within 30 Business Days resubmit the Deliverable in a form that shows all revisions made to the original version delivered to the State. The Contractor's correction efforts will be made at no additional charge. Upon receipt of a corrected Deliverable from the Contractor, the State will have a reasonable additional period of time, not to exceed the length of the original State Review Period, to review the corrected Deliverable to confirm that the identified deficiencies have been corrected.

2.258 Final Acceptance

Unless otherwise stated in the Article 1, Statement of Work or Purchase Order, "Final Acceptance" of each Deliverable must occur when each Deliverable/Service has been approved by the State following the State Review Periods identified in **Sections 2.251-2.257**. Payment will be made for Deliverables installed and accepted. Upon acceptance of a Service, the State will pay for all Services provided during the State Review Period that conformed to the acceptance criteria.

2.260 Ownership

Deleted – Not Applicable

2.270 State Standards

2.271 Existing Technology Standards

The Contractor will adhere to all existing standards as described within the comprehensive listing of the State's existing technology standards at http://www.michigan.gov/dit.

2.272 Acceptable Use Policy

To the extent that Contractor has access to the State computer system, Contractor must comply with the State's Acceptable Use Policy, see http://www.michigan.gov/ditservice. All Contractor employees must be required, in writing, to agree to the State's Acceptable Use Policy before accessing the State system. The State reserves the right to terminate Contractor's access to the State system if a violation occurs.

2.273 Systems Changes

Contractor is not responsible for and not authorized to make changes to any State systems without written authorization from the Project Manager. Any changes Contractor makes to State systems with the State's approval must be done according to applicable State procedures, including security, access and configuration management procedures.

2.280 Extended Purchasing

2.281 MiDEAL

Act Number 431 of the Public Acts of 1984 permits the State of Michigan, Department of Management and Budget, to provide purchasing services to any city, village, county, township, school district, intermediate school district, non-profit hospital, institution of higher education, community, or junior college. As a result of the enactment of this legislation, the MIDEAL Program has been developed. This program extends the use of state contracts to program members. The governmental agency must enter into an agreement with the State of Michigan to become authorized to participate, thus ensuring that local units of government secure a greater return for the expenditure of public funds.

In those cases, contract vendors supply merchandise at the established State of Michigan contract prices and terms. The Contract order must submit invoices and pay the authorized MIDEAL member on a direct and individual basis according to contract terms.

IT IS MANDATORY THAT THIS CONTRACT IS MADE AVAILABLE TO ALL STATE OF MICHIGAN AGENCIES AND AUTHORIZED MIDEAL PURCHASING PROGRAM MEMBERS.

Please Visit Mi DEAL at www.michigan.gov/buymichiganfirst under MiDeal.

Estimated requirements for authorized local units of government are not included in the quantities shown in this contract.

2.282 State Employee Purchases

Deleted – Not Applicable

2.290 Environmental Provision

2.291 Environmental Provision

Energy Efficiency Purchasing Policy – The State seeks wherever possible to purchase energy efficient products. This includes giving preference to U.S. Environmental Protection Agency (EPA) certified 'Energy Star' products for any category of products for which EPA has established Energy Star certification. For other purchases, the State may include energy efficiency as one of the priority factors to consider when choosing among comparable products.

Environmental Purchasing Policy – The State of Michigan is committed to encouraging the use of products and services that impact the environment less than competing products. The State is accomplishing this by including environmental considerations in purchasing decisions, while remaining fiscally responsible, to promote practices that improve worker health, conserve natural resources, and prevent pollution. Environmental components that are to be considered include: recycled content and recyclability; energy efficiency; and the presence of undesirable materials in the products, especially those toxic chemicals which are persistent and bioaccumulative. The Contractor should be able to supply products containing recycled and environmentally preferable materials that meet performance requirements and is encouraged to offer such products throughout the duration of this Contract. Information on any relevant third party certification (such as Green Seal, Energy Star, etc.) should also be provided.

Hazardous Materials:
For the purposes of this Section, "Hazardous Materials" is a generic term used to describe asbestos, ACBMs, PCBs, petroleum products, construction materials including paint thinners, solvents, gasoline, oil, and any other material the manufacture, use, treatment, storage, transportation or disposal of which is regulated by the federal, state or local laws governing the protection of the public health, natural resources or the environment. This includes, but is not limited to, materials the as batteries and circuit packs, and other materials that are regulated as (1) "Hazardous Materials" under the Hazardous Materials Transportation Act, (2) "chemical hazards" under the Occupational Safety and Health Administration standards, (3) "chemical substances or mixtures" under the Toxic Substances Control Act, (4) "pesticides" under the Federal Insecticide Fungicide and Rodenticide Act, and (5) "hazardous wastes" as defined or listed under the Resource Conservation and Recovery Act.
(a) The Contractor must use, handle, store, dispose of, process, transport and transfer any material considered a Hazardous Material according to all federal, State and local laws. The State must provide a safe and suitable environment for performance of Contractor's Work. Before the commencement of Work, the State must advise the Contractor of the presence at the work site of any Hazardous Material to the extent that the State is aware of the Hazardous Material. If the Contractor encounters material reasonably believed to be a Hazardous Material and which may present a substantial danger, the Contractor must immediately stop all affected Work, notify the State in writing about the conditions encountered, and take appropriate health and safety precautions.

(b) Upon receipt of a written notice, the State will investigate the conditions. If (a) the material is a Hazardous Material that may present a substantial danger, and (b) the Hazardous Material was not brought to the site by the Contractor, or does not result in whole or in part from any violation by the Contractor of any laws covering the use, handling, storage, disposal of, processing, transport and transfer of Hazardous Materials, the State must order a suspension of Work in writing. The State must proceed to have the Hazardous Material removed or rendered harmless. In the alternative, the State must terminate the affected Work for the State's convenience.

(c) Once the Hazardous Material has been removed or rendered harmless by the State, the Contractor must resume Work as directed in writing by the State. Any determination by the Michigan Department of Community Health or the Michigan Department of Environmental Quality that the Hazardous Material has either been removed or rendered harmless is binding upon the State and Contractor for the purposes of resuming the Work. If any incident with Hazardous Material results in delay not reasonable anticipatable under the circumstances and which is attributable to the State, the applicable SLAs for the affected Work will not be counted in time as mutually agreed by the parties.

(d) If the Hazardous Material was brought to the site by the Contractor, or results in whole or in part from any violation by the Contractor of any laws covering the use, handling, storage, disposal of, processing, transport and transfer of Hazardous Material, or from any other act or omission within the control of the Contractor, the Contractor must bear its proportionate share of the delay and costs involved in cleaning up the site and removing and rendering harmless the Hazardous Material according to Applicable Laws to the condition approved by applicable regulatory agency(ies).

Michigan has a Consumer Products Rule pertaining to labeling of certain products containing volatile organic compounds. For specific details visit http://www.michigan.gov/deq/0,1607,7-135-3310_4108-173523--,00.html

Refrigeration and Air Conditioning:
The Contractor shall comply with the applicable requirements of Sections 608 and 609 of the Clean Air Act (42 U.S.C. 7671g and 7671h) as each or both apply to this contract.

Environmental Performance:
Waste Reduction Program - Contractor shall establish a program to promote cost-effective waste reduction in all operations and facilities covered by this contract. The Contractor's programs shall comply with applicable Federal, State, and local requirements, specifically including Section 6002 of the Resource Conservation and Recovery Act (42 U.S.C. 6962, et seq.).

APPENDIX A
COST MODEL
MICHIGAN SMALL BUS SPECIFICATION
5 Years/150,000 Miles
18 Passenger Nonlift Bus – Lift Bus With Alternate Seating

Body Manufacturer: Coach & Equipment Manufacturing Corp.
Vendor Name: Shepard Bros., Inc.
Vendor Address: Midwest Office: 942 Surrey Way, Cincinnati, Ohio 45245
Corporate Office: 20 Eastern Blvd., Canandaigua, NY 14424

Vendor Signature

I. COST MODEL

Quantity				Unit Price	Total
		Passenger seats with vinyl seat covers			
16	Ea	A.	18 passenger bus without lift	$43,774.71	$ 700,395.36
38	Ea	B.	11+1 passenger bus with front passive lift	$47,278.67	$1,796,589.46
18	Ea	C.	8+2 passenger bus with front passive lift	$47,077.53	$ 847,395.54
8	Ea	E.	4+2 passenger bus with rear passive lift	$48,592.39	$ 388,739.12
		Passenger seats with fabric seat covers			
9	Ea	F.	18 passenger bus without lift	$44,020.68	$ 396,186.12
21	Ea	G.	11+1 passenger bus with front passive lift	$47,485.22	$ 997,189.62
10	Ea	H.	8+2 passenger bus with front passive lift	$47,243.80	$ 472,438.00
5	Ea	J.	4+2 passenger bus with rear passive lift	$48,811.79	$ 244,058.95
		Options – Alternate Quote Prices			
60	Ea	1a.	Air Conditioning System skirt mount	$5,808.15	$348,488.70
55	Ea	1b.	Air Conditioning System roof mount	$6,594.87	$362,717.91
60	Ea	2.	Manual entrance door (deduct)	$ (633.88)	$ (38,032.80)
60	Ea	3.	Diesel engine 6.0ℓ, minimum	$7,735.12	$464,106.96
30	Ea	4a.	Auxiliary air heater system-gas	$2,239.64	$ 67,189.05
10	Ea	4b.	Auxiliary air heater system-diesel	$2,239.64	$ 22,396.35
15	Ea	5.	Power seat base for driver's seat	$ 374.00	$ 5,610.00
5	Ea	6.	Destination Sign	$ 3,030.94	$ 15,154.70
5	Ea	7.	Ceiling Handrails	$ 327.96	$ 1,639.80
60	Ea	8.	Engine shutdown system	$ 84.99	$ 5,099.40
25	Ea	9.	Donation box	$ (650.02)	$ (16,250.55)
25	Ea	10.	Farebox Electrical Prep	$ 31.43	$ 785.63
25	Ea	11.	Rear emergency exit window	$ (450.34)	$ (11,258.50)
10	Ea	12a.	Paint - One stripe	$ 310.24	$ 3,102.40
10	Ea	12b.	Paint - Roof second color	$ 603.21	$ 6,032.12
10	Ea	12c.	Paint - Different Full body	$2,321.64	$ 23,216.40
20	Ea	13.	Folding Platform Passive Lift	$ 233.88	$ 4,677.54
25	Ea	14.	Rear five place passenger seat	$ 321.04	$ 8,025.93
20	Ea	15.	Two-way radio prep package	$ 208.69	$ 4,173.80
25	Ea	16.	Smooth Anti-slip Flooring	$ 455.66	$ 11,391.50
10	Ea	17.	Entrance Stepwell heater	$ 169.41	$ 1,694.10

TOTAL EVALUATION PRICE OF A, B, C, D, E, F, G, H, I, J, AND K ABOVE $7,132,952.61

APPENDIX A
EVALUATION FORM

			Size, Material Type, and Model Bid
II.	BODY SPECIFICATIONS		
A.	General design and construction		Body: FRP sidewalls, rear panel, roof panels & Laminated FRP Interior
B.	Body structure and exterior panels		
	1.	Rollover frame, steel cage type	1.5" x 1.5" 16 Ga. Galvanized Steel on 25" centers
		1a. Body section thickness	18 gauge Galvannealed steel transitional and skirt panels
	2.	Fiberglass composite type	Not Applicable
		2a. Body section thickness	Not Applicable
	3.	Exterior panels	[FRP] .085" thickness
	4.	Interior panels	Fiberglass Reinforced Plastic [FRP]
	5.	Interior length	Per spec: 169" back wall to driver area
	6.	Interior width	Per spec: 90"
	7.	Interior height	Per spec: 80"
	8.	Exterior length	263"
	9.	Exterior width	95"
	10.	Exterior height	115"
	11.	Rubrails	Per spec: 1.5" wide extruded plastic each side
	12.	Body overhang	Per spec: 72" rear
C.	Passenger door		Power C&E: Frame Aluminum, Panels Glass
	1.	Opening size	Height: 80" Width: 30" and 32"
D.	Stepwell – Material		Stainless Steel
E.	Interior, Material, Color		Per spec: FRP light gray
F.	Flooring		Per spec. 3/4" marine plywood and RCA colors
G.	Emergency exits		Per spec: Side Windows & E-Door 56"x 35"
H.	Gauges		Per spec: Ford OEM
I.	Fare box		Per spec: Main M4, spare vault & keys
J.	Bumpers		Per spec: FT: Chrome Ford, RR: Romeo Rim
K.	Mud Flaps		Per spec: Front & Rear rubber composite w/brkts.
L.	Towing		Per spec: Two rear tow hooks
M.	1.	Undercoating	Per spec: Dolphin
	2.	Rustproofing	Per spec: Dolphin and DuPont Corlar 825
N.	1.	Interior mirrors	Per spec: Rosco 1 Interior Mirror above Driver
	2.	Sunvisors	Per spec: Ford OEM Driver's side only
O.	Exterior mirrors		Per spec: Rosco Eurostyle remote & LT. crossview
P.	Seats		
	1.	Driver	Per spec: Ford OEM cloth
	2.	Passenger	Per spec: Freedman Feather Weight – Mid-Hi
	3.	Fold-up	Per spec: Freedman 3-Step Fold Away & Flip
Q.	Handrails, stanchions		Per spec: Dura-Diamond yellow and stainless
R.	Interior lighting		Per spec: LED lighting system.
S.	Exterior lighting		Per spec: Std. C&E LED Truck Lite Lighting
T.	Safety equipment		Per spec: 5# fire ext., ICC triangles, Belt Cutter
U.	Heating / ventilating		
	1.	Front system	Per spec: Ford OEM & Driver Fan
	2.	Rear system	Per spec: ProAir: 65,000 Btu Floor Heater
V.	Windows		Per spec: Upper "t" Top Sliders, Sampler
W.	Paint		Per spec: PPG White with optional colors
X.	Insulation		Exceeds spec: R-7 Factor 1 ½" Styrene
Y.	Lift (platform type), passive		Per spec: Ricon S Series Lift

APPENDIX A
EVALUATION FORM

Size, Material Type, and Model Bid

III. WHEELCHAIR SECUREMENT AREA

A.	Wheelchair securement	Per spec: Sure-Lok L-Track Retraktor or Q'Straint MAX
B.	Wheelchair restraints	Per spec: FF627S-4C Retraktor or Q'Straint Max
C.	Restraint storage	Per spec: Vinyl Pouch C&E Standard

IV. CHASSIS SPECIFICATIONS

A.	Chassis	Per spec: Ford E450 – 158" wheelbase 6.8L
B.	Tilt wheel/power steering	Per spec: Chassis OEM
C.	Wheelbase	Per spec: 158" OEM
D.	Engine – gasoline	Per spec: 6.8L OEM
E.	Transmission	Per Spec: TorqShift OEM
F.	Alignment	Per Spec: Ford Dealership Alignment
G.	Gross Vehicle Weight Rating (GVWR)	Per spec: 14,500 lbs.
	1. Front axle rating	Per spec: 5000 lbs.
	2. Rear axle rating	Per spec: 9500 lbs.
H.	Differential	Dana – Ford Chassis OEM Std. Ratio
I.	Battery	Per spec: Dual batteries Maintenance Free
J.	Battery Cables and Grounds	Per spec: Approved by OEM/Ford QVM
K.	Alternator	
	1. Gasoline	Per spec: Ford OEM 195 Amp
	2. Diesel	Per spec: Ford OEM dual alternators 140/120Amps
L.	Engine fast idle control	Per spec: Inter Motive
M.	Brakes	Per spec: Ford OEM 4-Wheel Disc with ABS
N.	Fuel tank	Per spec: Ford OEM 55 gallon
O.	Hazard flashers	Per spec: 4-Way Flashers w/ Dash mounted switch)
P.	Shock absorbers	Per spec: Ford OEM Gas Type
Q.	Suspension	Per spec: Ford OEM with rear assist
	1. Front	Per spec: Ford OEM Coil Twin I Beam
	2. Rear	Per spec: Ford OEM Leaf with added assist
R.	Stabilizer	Per spec: Front and Rear Ford OEM bars
S.	Wheels	Per spec: Ford OEM steel white 16" x 7"
T.	Tires	Per spec: Steel Belted Radial Ford OEM
U.	Drive shaft	Per spec: With guards Ford OEM
V.	Wipers / Horn	Per spec: Ford OEM dual horns/intermittent wipers
W.	Radiator and cooling system	Per spec: Ford OEM
X.	Fluids	Per spec: Full fluids and fuel tank min. ½ full
Y.	Engine cover	Per spec: Ford OEM
Z.	Exhaust system	Per spec: Ford OEM w/ C&E added street side exit

V. OTHER ITEMS

A.	Safety	
	1. Reverse alarm	Per spec: C&E standard Ecco 510
	2. Rear door alarm	Per spec: C&E standard Cole Hersee [CH] A099
	3. Lift master switch and light	Per spec: C&E std. CH 59024-100 Trucklite 80360
	4. Lift door open indicator	Per spec: C&E Standard Arrow 054 00-722
	5. Lift interlock	Per spec: Intermotive ILIS
	6. Headlight control	Per spec: Ford OEM
	7. Strobe light	Per spec. C&E Standard, Signal Stat

APPENDIX A
EVALUATION FORM

			Size, Material Type, and Model Bid
B.	Electrical		
	1.	Lift circuit breaker	Per spec:_____70 Amp protection _ _____
	2.	12-volt power point	Per spec: Ford OEM
	3.	Wire coding and harnesses	Per spec: Number stamped, C&E standard
	4.	Electrical panel	Per Spec: C & E std. See wiring diagrams
	5.	Wiring support	Per spec: P clamps, ties & loom
	6.	Wiring grounds and capacity	Per spec: Approved by Ford OEM/QVM
	7.	Constant run solenoid	Per spec: See C&E wiring diagrams
	8.	Circuit capacity & function	Per spec: we certify to sufficient capacity & function
	9.	Wiring protection	Per spec: Loom and Grommets
	10.	Wiring routing	Per spec: C&E standard
	11.	Wiring connections	Per spec: Plug & Play {See description w/ questions}

VI. OPTIONS – ALTERNATE QUOTES

A.	Air conditioning system		
	1.	Option A	Carrier 513T 53,000 Btu single compressor
	2.	Option B	Carrier 5R13T 53K Btu w/roof condenser
B.	Manual entrance door		Per spec: C&E Standard
C.	Diesel engine 6.0ℓ, minimum		Per spec: Ford OEM 6.0L Power Stroke
D.	Auxiliary air heater system		Per spec:
	1.	Gas	Per spec: Espar or Webasto
	2.	Diesel	Per spec: Espar or Webasto
E.	Power seat base for driver's seat		Per spec: Ford OEM 6-Way
F.	Destination sign		Per spec: Luminator Vista
G.	Ceiling Handrails		Per spec: C &E Standard Stainless Steel
H.	Engine shutdown system		Per spec: Murphy or Ford OEM
I.	Donation Box		Per spec: Main or Diamond
J.	Farebox Electrical Prep		Per spec: C&E Electrical Design
K.	Rear emergency exit window		Per spec: C&E standard rear exit window w/fresnal
L.	Paint – Optional Designs		Per spec: C&E paint booth PPG or DuPont
M.	Folding platform passive lift		Per spec: Ricon Klearview
N.	Rear five place passenger seat		Per spec: Freedman Feather Weight Mid-Hi
O.	Two way radio prep package		Per spec: Coach & Equipment standard electrical
P.	Smooth anti-slip flooring		Per spec: Altro META
Q.	Entrance stepwell heater		Per spec: Lighthouse Warm Welcome

The following option is listed for information only. IF the option is available please indicate an approximate installed price.

		Available	Price
A.	Natural Gas Application (CNG or LNG)	YES ____ NO __X__	_____

APPENDIX A
EVALUATION FORM

VII. VENDOR / MANUFACTURER REQUIREMENTS

A.	Bus information furnished	As required and additional if requested
B.	Manufacturer quality control (name/title)	George D'Amato/Quality Manager
C.	Air conditioning certification	We certify compliance & to pilot bus requirements
D.	Heating/Ventilating certification	We certify compliance & to pilot bus requirements
E.	Purchaser inspection	We certify compliance w/ inspection requirements
F.	Warranty	We exceed specs & request a favorable evaluation
G.	Miscellaneous	
	1. Turning radius wheel to wheel	Curb-to-Curb 27.5'
	2. Turning radius wall to wall	Wall-to-Wall 28.35'

VIII. BID DOCUMENTS

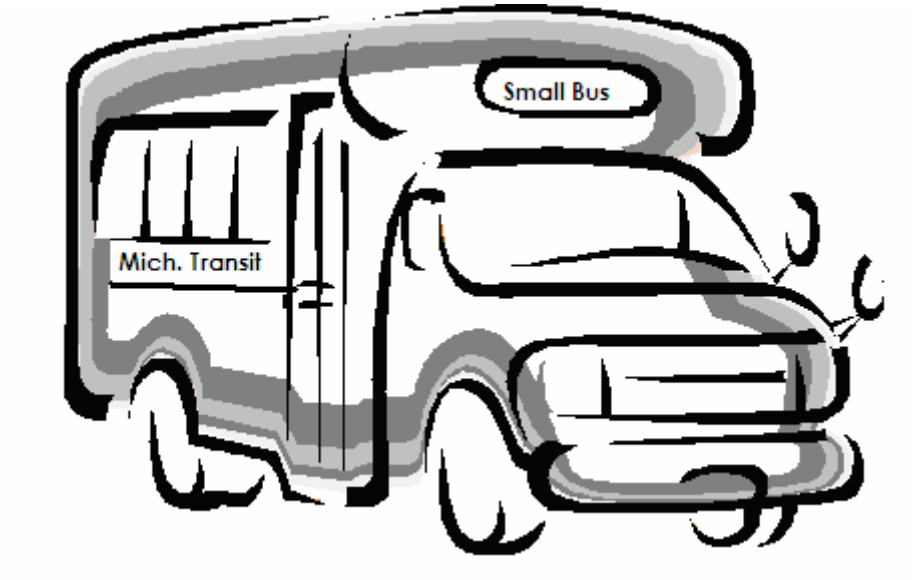
Please mark (X) as completed.

A.	Completed Michigan Bus Specification forms	X
B.	Bus floor plans	X
C.	Entrance door and door opening device design	X
D.	Entrance step configuration design	X
E.	Roof, sidewall, and flooring drawings	X
F.	Manufacturer's chassis description	X
G.	Body to chassis frame mounting	X
H.	Wheelchair lift manufacturers' specifications	X
I.	Body, chassis, and drive train warranties	X
J.	Bus Rollover protection Test (FMVSS 220) Certification	X
K.	Federal Transit Administration (FTA) Clauses	X
L.	Seat covering material flammability and smoke data	X
M.	Seat frame salt spray test data	X
N.	Seat and seat belt certification	X
O.	Wiring and switch certification	X
P.	Dealer Agreement	N/A
Q.	Bus Testing Certification	X

CONTRACTOR COMMENTS:

Note that we have not included "P. Dealer Agreement" since Michigan withdrew this requirement from the RFP in their responses to questions.

APPENDIX B
STATE OF MICHIGAN



PUBLIC TRANSPORTATION

SMALL BUS SPECIFICATIONS
5-Years/150,000 Miles
18 Passenger Nonlift bus - Lift bus with Alternate Seating

Bureau of Passenger Transportation
Bus Acquisition & Intercity Transportation Section

MDOT
Michigan Department of Transportation

REVISED 11/21/2008

APPENDIX B
STATE OF MICHIGAN
Small Bus Specifications
SPECIFICATIONS

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IX. TABLE 1 ***51***

STATE OF MICHIGAN

APPENDIX B - SPECIFICATIONS

5-Years/150,000 Miles

18-PASSENGER NON-LIFT SMALL BUS AND LIFT BUS WITH ALTERNATE SEATING

I. PURPOSE OF SPECIFICATIONS

These specifications are setting forth the minimum requirements for a two-axle, transit class commercial non-lift bus or Paratransit type commercial bus equipped with a commercial wheelchair lift. The body shall be mounted on a commercial or recreational vehicle (RV) chassis. The small bus must be capable of meeting all seating requirements (see Section X. Bus Seating Requirements). It shall be fully tested at the Penn State bus test facility in Altoona, Pennsylvania to Federal Transit Administration [FTA] minimum service life category of 5-years/150,000 miles. As a minimum, buses must meet all applicable Michigan Motor Carrier Vehicle Codes, all applicable Federal Motor Vehicle Safety Standards (FMVSS) and the Americans with Disabilities Act (ADA).

Any successful bidder supplying these buses shall quick title and deliver the bus and the title to the location specified by the State of Michigan, Bureau of Passenger Transportation. Chassis serial number, body number, axle ratio, gross vehicle weight rating (GVWR), seating capacity and paint codes shall be imprinted on a permanent decal(s) or stamped on a metal plate(s) and affixed in the driver's area of the bus (location to be approved by the State).

A copy of the dealer agreement between the Bus Manufacturer and the designated dealer will be required as part of the bid. Also, repair facilities shall be established throughout the State to provide chassis and body service support to transit agencies to minimize agency travel to reach the nearest repair facility. The successful bidder must be capable of providing parts and service for a period of seven years after the buses have been placed in service throughout the State of Michigan. The successful bidder must be able to supply body replacement parts within five working days of a request by a transit agency unless the bidder notifies the transit agency that the part is not available for shipment and provides the shipping date when the part will be available.

Regardless of options and seating plan ordered, the successful bidder shall be responsible for certifying that all buses delivered: 1) shall not exceed 95% of front spring and 95% of rear spring capacity rating at ground without exceeding GVWR of chassis as bid (determined by engineering calculated loaded vehicle axle weights), and 2) single wheelchair securement area buses shall not exceed 21' 11" in length measured bumper to bumper excluding the energy absorbing portion of the bumper (distance of travel allowed for compression of the bumper without body deformation). Manufacturers shall comply with the chassis company's quality vehicle manufacturing program such as Ford's Quality Vehicle Modifier (QVM).

In these specifications any required approvals shall be made by the State. Wherever brand, manufacturer, or product names are used, they are included only for the purpose of establishing a description of minimum quality of the item. This inclusion is not to be construed as advocating or prescribing the use of any particular brand or item or product. For this bid a formal question and answer period has been scheduled to consider approved equals and exceptions to the bid specifications. A written response will be made for all bidders prior to the bid due date. The State must be able to determine whether the bidder's offered product is or is not equal to the product described in the specifications from information (technical data, test results, and the like) contained in the bid. All detailed descriptions and specifications provided in the bid must match the product offered for use in the bid.

II. BODY SPECIFICATIONS

A. General Design and Construction

SAFETY: The chassis and body shall be designed using only prudent, proven engineering principles with all work performed only by professional established firms. The bus purchased shall comply with all State regulations and requirements applicable to the design and manufacture of motor vehicles for the State of Michigan.

DRIVER SIZE and COMFORT: Design criteria of bus purchased shall be for all females from the 5th percentile, to males of the 95th percentile, to be equally as comfortable in using all controls required to safely drive and maneuver the bus. All driver controls shall comply with FMVSS 101, with hand and foot controls required to operate the bus safely, including the placement of exterior/adjustable mirrors, positioned to meet this safety requirement.

QUALITY of WORKMANSHIP: All labor employed in both the manufacturing and assembly processes of the bus purchased shall be to the highest industry standards. The entire bus shall be within all established engineering tolerances set by all parties involved in the design and production of the bus. All added components shall be installed and positioned according to the component manufacturer's installation procedures which shall be available upon request.

WELDING: All welding procedures used throughout the construction of the bus (including materials, qualifications and training of personnel) shall be in accordance with the standards of the American Society for Testing and Materials (ASTM) and the American Welding Society (AWS). Contact surfaces of all material to be welded shall be clean, and free of grease, paint, rust and scale. After welding, all rough edges and surfaces on parts shall be ground smooth and coated with a corrosion inhibiting primer and paint.

ATTACHMENT HARDWARE: All rivets, screws, bolts, nuts, washers and/or other types of fasteners used in the construction process shall be of appropriate size and strength rating for the application. They shall be sprayed with or dipped in a rust-resistant coating material, be plated, be stainless steel, or otherwise be made of rust-resistant type material all of which will pass the 1000 hour ASTM D117 Salt Spray test and the 1000 hour ASTM D2247 Humidity Resistance test. Fasteners used by the respective component manufacturers in their assemblies are acceptable as part of the assembly. The use of self-tapping screws shall be limited to flooring attachment and to steel. Self-tapping screws shall not be utilized in any fiberglass attachment.

B. <u>Body Structure and Exterior Panels</u>

All steel used in the body and floor structure shall be stored out of the elements to prevent early corrosion.

1. Metal Rollover Frame, Cage-type Construction

a. The bus shall have a heavy-duty, unit-body structure type. The body structure (rollover frame, cage type of gauge #16 steel, 0.060" or equal, minimum) shall be of durable steel or aluminum construction, and adequately reinforced at all joints and points of stress, with sufficient strength to comply with the FMVSS 220 rollover protection test. All body and floor structural members (tubes, channels, etc.) shall be Gas Metal Arc Welded (GMAC) or equal at each joint. Each bidder

shall provide certification with the bid that the bus, as bid, meets the FMVSS 220 rollover protection test (see Section VIII).

b. The bus shall be designed to withstand road shocks, stop and start operations, seasonal weather and road extremes, and other conditions found in Michigan transit bus service. The body shall be securely fastened to the chassis frame structure using a method of uniform attachment consisting of strategically placed rubber isolators/cushions with connector bolts that permit body flexing independent of chassis flexing. Roof, side, front, and back panels shall be secured to the body vertical and horizontal frame members, and these, when fastened to the floor structural members, result in a permanent, fully-integrated structural unit adequately reinforced at all points where stress concentration may occur. The body floor sub-frame assembly, including lower skirt reinforcements, shall be gauge number 14 (.075" thickness) minimum galvanized steel (mill applied), gauge number 16 stainless steel, gauge number 12 aluminum, or cold or hot rolled steel with corrosion resistant coating, each of which shall have equal mechanical and corrosion resistance properties as gauge number 14 galvanized steel as a minimum. Wheelwells shall have minimum yield strength of gauge number 14 (.075" thickness) galvanized steel, gauge number 16 (.060" thickness) stainless steel, or gauge number 12 (.10" thickness) aluminum properly welded or secured with approved corrosion resistant fasteners to the floor structure. The entire body cage and frame including floor structure shall be properly coated with a corrosion resistant coating or a non -water permeable primer/paint. All box type tubing used in the floor structure shall have the interior of the tube coated with corrosion resistant material as outlined in Rustproofing/Undercoating Section II., M. All components treated to resist corrosion shall be properly cleaned to remove greases, oils, and residues before application of the corrosion resistant material. Passage holes provided for wiring and hoses shall be thoroughly sealed to prevent dust and moisture intrusion and be sufficiently protected to ensure against wear from friction and the elements. When completed, all body side sections and roof sections including structure shall be at a minimum 1¼" thick. Where body segments are joined they shall be properly sealed to prevent intrusion of drafts, fumes, dust, and water to the interior of the bus body.

c. All exterior side and roof panel material shall be gauge number 20 (.035 thickness) galvanealed steel, or metal of equal mechanical properties, minimum. If fiberglass, it shall have as a minimum, the mechanical properties equal to gauge number 20 (.035" thickness) steel according to American Society of Mechanical Engineers (ASME) industry standards and must have State approval. The corners, transitions, front panels, and other locations requiring additional strength shall use steel or other metal with mechanical properties to match the structural integrity requirements. Reinforcements shall be installed around all window openings in order to transfer stress around the opening. All door openings shall have full structural framing (tube) or imbedded reinforcements equal to the structural members of the body that will adequately support concentrations of stress around openings. All exposed door frame structure shall be made of 304 stainless steel, acid-etched, coated with zinc based primer and powder coated OEM white (including the fasteners). Where a stiffener or a backer material (substrate) is used for the exterior panels, it shall be bonded with waterproof adhesive to the exterior panel; it shall be a water resistant material that will not wick water; and it must be thoroughly sealed from the elements when installed so that the substrate will not be exposed to or absorb moisture and cause corrosion to the interior of the panel or

any body structure. Exterior panel substrate shall not be of wood composition, plywood or a pressed wood product. Where body segments are joined they shall be properly sealed to prevent intrusion of drafts, fumes, dust, and water to the interior of the bus body.

d. All interior panels and trim may be made of scuff-resistant laminate/FRP or molded ABS finished material. Trim/interior panels shall have as a minimum the physical properties of gauge number 24 (.024" thickness). Trim/interior panel threaded fasteners or rivets shall secure trim/panels to body framing structure. Where fasteners are in the panels only, a reinforcing nut or reinforcing panel shall be installed for added strength and fastener retention.

e. Exterior lower skirt panels may be metal or fiberglass and shall be sufficiently stiff to prevent vibration, drumming, or flexing while the bus is in service. Body front and/or rear endcaps may be molded fiberglass panels installed with required structural framing or a FRP composite structure. Highly corrosion resistant metal lower-skirt panels shall consist of compatible materials not subject to electrolysis and shall be sufficiently fastened and braced to prevent damage from ice and snow build-up. Metal lower skirt panels shall be properly coated to resist corrosion (exterior and interior), see Section II., Part M., Undercoating. Lower skirt panels may be one piece in length at manufacture but shall be repairable in sections. Lower skirt panels shall not use a wood substrate material for a panel stiffener. Where exterior panels are lapped, the upper or forward panels shall act as a watershed. Exterior panels that are cut shall have the cut edge sealed (paint or special sealing compound). Sealing and fastening of panel joints, including front and rear cap-to-body joints, shall prevent entrance of moisture and dirt. Joint sealing shall be made through use of a non-shrinking bonding sealant, and joint sealing shall not be solely dependent on an exterior trim strip or a trim cap nor shall the sealing of the panels be dependent on caulking alone. All exterior panels shall be buck riveted and/or bonded to the body frame structure. Exterior metal panels shall be given a thorough anti-corrosion treatment.

f. The exterior body panels shall have on each side one heavy-duty rubrail. Rubrails (1½" x 1/2" minimum) shall be extruded solid aluminum or extruded UV resistant plastic with a flexible, rubber-type resilient material insert or a solid rubber-type of flexible, resilient material. Rubrails shall be located no less than 25" nor more than 43" above the ground on each side. Rubber fender splash guards shall be installed on front and rear wheel openings. Where the rubrails and fender opening guards are not an integral part of the body, installation of rubrails and fender opening splash guards shall be made after the finish coat of paint is applied to the bus.

g. Gun installed huckbolt fastenings, buck rivets, bonding adhesives, or approved equivalent shall be utilized on all exterior body panels, rubrails, and all other locations where stress is concentrated. All rivets, screws, bolts, nuts, washers, clamps, and other types of fasteners used in the construction process, including those that would be exposed to the elements, on the exterior and interior of the unit shall be properly plated to resist corrosion. No sheet metal screws shall be permitted, except for rubrails and rubber fender splash guards which can be secured with stainless steel or equivalent plated locking-type, self-tapping fasteners. Fastener materials shall be compatible with materials being fastened.

Where self-tapping fasteners are used, body panels shall be reinforced with steel backing, aluminum backing, or stainless steel backing.

h. Window openings cut into body panels shall have a maximum frame clearance of $^{1}/_{8}$" on each side to minimize the need for caulking (see Section II. V., Windows). All openings cut into metal body exterior panels must have the exposed cut edges primed or properly coated to inhibit water intrusion and corrosion before further assembly or painting occurs. Window frames installed in the body openings, shall be properly caulked/sealed to prevent intrusion of moisture and dust.

2. Fiberglass Reinforced Plastic (FRP) Composite Unitized-type Body

a. The bus body shall have a heavy-duty unitized structure and shall be of durable fiberglass reinforced plastic (FRP) composite construction. The body panels shall consist of an exterior high gloss gelcoat (.020" thickness, minimum) on a resin-hardened FRP (3/16" thickness, minimum) attached to a center layer of resin hardened Nida-Core® or equal honeycomb (¾" thickness, minimum) with an inner FRP panel (3/16 " thickness, minimum); or may be ¾" polyurethane foam insulation gelcoated to $^{1}/_{4}$" FRP exterior with $^{1}/_{4}$" FRP interior, reinforced with steel perimeter and transverse supports, completely fiberglassed to adjoining body parts. It shall use proper adhesive materials to adequately bond and mechanically fasten all joints and points of stress with sufficient strength to comply with the FMVSS 220 rollover protection test. Each bidder shall provide certification with the bid that the bus as bid meets the FMVSS 220 rollover protection test (see Section VIII).

b. The bus shall be designed to withstand road shocks, stop and start operations, seasonal weather and road extremes, and other conditions found in Michigan transit bus service. The body shall be securely fastened to the chassis frame structure using a method of uniform attachment consisting of strategically placed rubber isolators/cushions with connector bolts that permit body flexing independent of chassis flexing. Roof, side, front, and back panels shall be secured to the floor and lower body frame members; all of which shall result in a permanent, fully-integrated structural unit adequately reinforced at all points where stress concentration may occur. The body floor sub-frame assembly, including lower skirt reinforcements, shall be gauge number 14 (.075" thickness) minimum galvanized steel (mill applied), stainless steel, aluminum, or cold or hot rolled steel with corrosion resistant coating (including steel treated with a sprayed on coating), each of which shall have equal mechanical and corrosion resistance properties as gauge number 14 (.075" thickness) galvanized steel as a minimum. Wheelwells shall have minimum yield strength of gauge number 14 galvanized steel, gauge number 16 (.060" thickness) stainless steel, or gauge number 12 (.10" thickness) aluminum properly welded or secured with approved corrosion resistant fasteners to the floor structure. Passage holes provided for wiring and hoses shall be thoroughly sealed and protected to prevent dust and moisture intrusion and be sufficiently protected to ensure against wear from friction and the elements. The entire lower body frame shall be coated with corrosion resistant primer/paint (steel) or properly treated to resist corrosion (other materials). All treated components shall be properly cleaned to remove greases, oils, and residues before application of the corrosion resistant material.

c. All exterior side and roof panels when completed shall be at a minimum 1 $^{1}/_{8}$ " thick. Bond lines at the side walls, rear endcap, roof, and front cap shall be interlocked by adhesives, resin saturated fiberglass matting, and mechanical fasteners, forming a unibody design without exposed fasteners or protruding moldings. Imbedded reinforcements equal to the structural members of the body shall be installed at all door openings in order to support door mounting hardware and door operating mechanisms. All door openings shall have full structural framing to maintain integrity of the body structure. All exposed door frame structure shall be made of 304 stainless steel acid-etched, coated with zinc based primer and powder coated OEM white (including the fasteners).

d. Interior panels may be an integral part of the FRP composite panel or may be made of scuff-resistant laminate/FRP finished material. Molded ABS may be used as trim but not for interior panels. Where threaded fasteners are in the trim/interior panel only, an imbedded reinforcing nut or a reinforcing panel shall be integrated into the FRP composite for added strength and fastener retention.

e. Exterior panels may be an integral part of the FRP composite panel. Exterior panels shall be sufficiently stiff to prevent vibration, drumming, or flexing while the bus is in service. Lower skirt panels shall be sufficiently fastened and braced to prevent damage from ice and snow build-up. Lower skirt panels may be one piece in length at manufacture but shall be repairable in sections. Where panels are lapped, the upper and/or forward panels shall overlap the lower and/or rearward panels to prevent intrusion of water under the panels. Sealing and fastening of joints, including front and rear cap-to-body joints, shall prevent entrance of moisture and dirt. All exterior panels shall be bonded to the lower body frame. In no case shall the sealing of the panels be dependent on caulking alone.

f. The exterior body panels shall have on each side one heavy-duty rubrail. Rubrails (1½" x ½" minimum) shall be extruded solid aluminum or extruded UV resistant plastic with a flexible, rubber-type resilient material insert or a solid rubber-type of flexible, resilient material. Rubrails shall be located no less than 25" nor more than 43" above the ground on each side. Rubber fender splash guards shall be installed on front and rear wheel openings. Where the rubrails and fender opening guards are not an integral part of the body, installation of rubrails and fender opening splash guards shall be made after the finish coat of paint is applied to the bus.

g. No sheet metal screws shall be permitted, except for rubrails and rubber fender splash guards which can be secured with stainless steel or equivalent plated locking-type, self-tapping fasteners. Fastener materials shall be compatible with materials being fastened and meet the 1000 hour ASTM D117 Salt Spray test and the 1000 hour ASTM D2247 Humidity Resistance test. Where self-tapping fasteners are used in body panels, the body panels shall have an imbedded reinforcing nut or a reinforcing panel shall be integrated into the FRP composite for added strength and fastener retention.

h. Window openings cut into body panels shall have a maximum frame clearance of $^{1}/_{8}$" on each side, to minimize the need for caulking (see Section II. V., Windows). All openings cut into body exterior panels must have the exposed edges of the cutout properly coated to prevent moisture intrusion before further assembly or

painting occurs. Window frames installed in the body openings shall be properly caulked/sealed to prevent intrusion of moisture and dust.

C. Passenger Door

1. The manufacturer shall provide a heavy duty electrically operated passenger entrance door. The passenger entrance door shall be a split-type double leaf swing door. This door shall have a flexible soft rubber cushion on the meeting edge 1½ " in width, minimum. The door glass shall be see-through, AS-2 tint (70% luminous transmittance) safety glass. Under all operating conditions and bus speeds, an airtight, watertight, and dust-proof seal shall be formed between the door and the stepwell, between the door and body opening, and between the door leaf sections. The door leading edge opening speed shall not exceed 18 inches per second and the closing speed shall not exceed 12 inches per second to provide a total door closing or opening in 2 to 4 seconds. The front passenger entrance door shall not extend below the step frame. The door shall be located on the right side of the bus near the front wheel. Any door with an exposed (metal showing) outer frame shall be made of 304 stainless steel acid-etched, coated with zinc based primer and powder coated OEM white (including the fasteners). The entrance door shall provide a 30" clear width opening, minimum. Door opening height from the top of the first step to the door header shall be a minimum of 76". Where interior height is low at the entrance header, the header shall be padded to prevent injury to those exiting the bus.

2. The door frame strength and electric door operator strength shall be designed to match the entrance door size. The operator for the entrance door shall be located in an overhead compartment above the passenger entrance doorway; shall be concealed from passengers; and shall be easily accessible for servicing through a hinged access door. The access door shall be hinged to open up with a holding device and shall be as large as will fit in the overhead compartment space. Door motor operation shall be limited electrically to control door travel at full open and full closed positions and shall be adjustable to keep the door closed during bus operation. Physical door stops shall be used to prevent marring or damage to doors and/or surrounding parts. An entrance door manual release that allows disconnection and simple re-engagement of the door operator shall be provided so that the entrance doors can be manually opened in the event of loss of electrical power or other emergency. The door operator motor shall not run continuously when the manual release is operated. Electric door operator, door linkage, and baseplate components shall be of a single manufacturer. Suggested source: Excell, Vapor.

3. The passenger door control switch shall be located in the driver's compartment within easy reach of the driver and be clearly marked for "open" and "close" (switch shall operate the same on all buses). The control switch shall be powered by a constant battery feed circuit with circuit breaker protection. The control switch shall be "hold on" for operation and of a different color than other standard switches.

4. A method shall be provided to lock all entrances to the bus when it is not in use.

D. Passenger Stepwell

All entrance steps and stepwells shall be gauge number 14 (.075" thickness) stainless steel, minimum. Steps and stepwells shall have adequate structural bracing. All metal trim hardware in the stepwell area shall be stainless steel. All fasteners in the stepwell area shall be stainless steel

which will pass the 1000 hour ASTM D117 Salt Spray test and the 1000 hour ASTM D2247 Humidity Resistance test. Ground to first step shall not exceed 12" in height, each additional vertical step shall not exceed 9 ½ " and all tread depths shall be 9" minimum. All steps in the entrance stepwell shall be of the same width. A suspension kneeling feature may be used to achieve the required 12" step height. Stepwells shall be covered with flooring material as described in Flooring, Section II., F., Item 3). Any interior stainless steel except for exposed door frames shall be brushed, not painted.

E. Interior

1. The interior of the bus shall provide a pleasant, aesthetically pleasing atmosphere. The door and driver instrument panel are to be painted or otherwise finished with a nonreflective, anti-glare finish which matches the overall interior tones of interior panels. All interior hinged access doors shall use SouthCo Model #M1-61-1 latch to hold the door positively closed. All interior markings shall be durable materials affixed to the interior panels' smooth surfaces or markings shall be durable materials affixed to metal plates fastened to the interior panels of the bus. The interior design and colors shall be approved by the State.

2. All interior panels may be made of scuff-resistant, textured paint on steel, or laminate/FRP finished material. A light grey color shall be installed in the interior area above the seat rail lines, in the ceiling area, and on the rear endwall. All materials and treatments shall be easily cleaned. Panel fastening devices shall match color of panels. All interior finished surfaces shall be impervious to diesel fuel, gasoline, and commercial cleaning agents. Finished surfaces shall not be damaged by controlled applications of graffiti-removing chemicals.

3. The interior height of the passenger compartment at center aisle shall be 74" minimum. At 6" from the sidewall there shall be 67" of interior height, minimum, with a gradual contour to the center aisle (no bulkheads). Interior headroom at the back of bus (rear air conditioning evaporator area) may be reduced to a minimum of 60", but it shall increase to the normal ceiling height at the front of the rear seat cushion. The interior width at seat line shall be 90", minimum.

4. All surfaces, items, or hardware in the passenger compartment having sharp edges, corners, or angles that could cause injury, shall be padded with a heavy-duty, vinyl-covered, energy absorbing material to match interior colors. Areas inside the passenger compartment of low headroom where a person is prone to strike his head shall be marked and padded. All handrails shall have rounded edges where exposed.

5. A storage area with a hinged, lockable, access door shall be provided in the interior area either above the windshield (without destination sign) or on the side above the driver as space permits. This area above the windshield shall also be constructed to adequately support 60 pounds of two way radio communication equipment. A restraint shall be installed to prevent any storage door from opening beyond 105° when the installation allows the door to swing down to open.

F. Flooring

1. The floor deck may be integral with the basic structure or mounted on the structure securely to prevent chafing or horizontal movement. All floor fasteners shall be corrosion

resistant steel and shall remain secured and corrosion resistant for the service life of the bus. The floor deck shall be 3/4 " A/B plywood of marine grade material, minimum, with sealed edges to prevent moisture intrusion. The floor deck upper surface shall have all cracks and voids filled and the whole surface rough sanded before installing the flooring material. A layer of sealer shall be installed between floor deck edges that butt against structural members and other deck sections to prevent dust and moisture intrusion. Passage holes provided for wiring and hoses in the floor deck shall be thoroughly sealed to prevent dust and moisture intrusion and be sufficiently protected to ensure against wear from friction and the elements. Passenger seating floor rail/track shall not be installed in the wheelchair lift or wheelchair securement areas. The floor deck, including the sealer, attachments, and coverings, shall be waterproof, non-hygroscopic, resistant to wet and dry rot, resistant to mold growth, and impervious to insects. The floor deck shall not be sandwiched between the wall structural members and the floor structural members.

2. The stepwell, entrance area, and center aisle floor area shall be overlaid with ribbed, slip resistant, oil resistant commercial 3/16" step tread thickness. Suggested Sources: RCA Rubber Transit-Flor® , Rubber Solutions N.A., SMI SpecFlor

3. The aisle to door area flooring joint shall make a miter so that aisle and door area flooring grooves line up for easy cleaning.

4. The 1/8" thickness flooring under the seats and in the wheelchair area shall be smooth, slip resistant, oil resistant. The flooring shall extend up the sidewall and rear wall to the seat rail line and shall be coved at the floor/wall joint to form a smooth water-tight transition. Flooring adhesive shall be oil resistant. Suggested Sources: RCA Rubber Transit-Flor ®, Rubber Solutions N.A., SMI SpecFlor.

5. Step treads shall be two-piece ribbed rubber flooring. Each tread shall have a band of bright yellow contrasting color molded in the full width of the step (must meet ADA contrast requirement). Step tread to stepwell joints shall be sealed to prevent intrusion of moisture and debris.

6. An aisle width standee line of bright yellow contrasting color shall be placed crosswise in the aisle just behind stepwell (must meet ADA contrast requirement).

7. Color of all flooring and step treads shall be equal to RCA Rubber Transit-Flor® grey (#766) or tan (#777) as requested by the agencies.

8. To provide easy access for service, the floor shall have a vapor and fumeproof bright aluminum diamond plate access panel to reservoir fill/check areas and fuel tank sending unit.
The access panel to the fuel tank sending unit can be removed; however, the contractor is still required to provide an access panel to the reservoir fill/check areas.

9. Wheelwells shall be thoroughly sealed to prevent intrusion of moisture and dirt. Metal wheelwells inside the passenger compartment shall be covered with flooring material or molded fiberglass (FRP or ABS).

10. Standee decals shall be furnished and mounted at the center of the bus above the windshield.

G. Emergency Exits

1. Each bus shall be equipped with a rear exit door with a minimum opening of 1296 square inches with a minimum size of 24" by 54" (a rear exit window in place of the door is optional). All exposed exit door frame/jamb structure shall be made of 304 stainless steel acid-etched, coated with zinc based primer and powder coated OEM white (including the fasteners. The rear door exit and side window exits shall meet federal requirements of FMVSS 217. The manufacturer shall provide a method to lock the rear exit door. The rear exit door shall have an audible alarm at the driver's area activated when the exit door latch handle starts to open and when the exit door is locked with the ignition on. A bus with a rear exit door shall have one small window on each side of the exit door in the rear endcap.

2. The rear exit door shall have two windows, an upper window and a lower window, as a part of the door. The door glass shall be see-through, AS-2 tint (70% luminous transmittance) safety glass. The upper door window height shall match top of rear bus windows, one on each side of rear door. Door windows shall match design of bus rear windows. Any door with an exposed (metal showing) outer frame/jamb shall be made of 304 stainless steel acid-etched, coated with zinc based primer and powder coated OEM white (including the fasteners). Heavy-duty door latch mechanism with handle guard shall provide a quick release for opening from inside and outside the bus but be designed to offer protection against accidental release. The door latch shall cause the door to compress the perimeter door seal to provide an airtight, dustproof and watertight seal around the door under all operating conditions and speeds. The door must also have a sliding door stop mounted on top of the door to automatically lock door in the open position for emergency use. This door stop must also have a manual release. Door panels shall match exterior and interior body panels (see section II. A., B., and C.). All doors shall be fitted with screwed or bolted-on heavy-duty stainless steel piano hinges or heavy duty hinges of a noncorrosive material. A restraint shall be installed to prevent the door from opening beyond 105° or striking the rear panel of the bus when the door is opened.

3. A passage way of 16" minimum width shall be provided to the rear exit door. No seats or other objects shall be placed in bus which restricts passageway to rear exit door.

4. One non-closing static exhaust vent, a combination roof vent-emergency exit (23" by 23" minimum), shall be installed at the mid point on the longitudinal center line of the roof of the passenger section of the bus. The roof vent-escape hatch shall provide fresh air flow inside the bus when opened and when the bus is in a forward motion. The escape hatch shall have an inside and an outside release handle. There is no warning buzzer requirement for the escape hatch. Suggested source: DMA 1122, Specialty Manufacturing Co., Transpec Inc. .

5. Instructions for proper use of all emergency exits shall be marked in close proximity to the release mechanisms. All interior markings shall be durable materials affixed to the interior panels' smooth surfaces or markings shall be durable materials affixed to metal plates fastened to the interior panels of the bus. Instructions may be labels, of contrasting color, affixed to a location that shall be approved by the state. All emergency exits shall be marked on the exterior of the bus.

6. Lever-type latches used for emergency windows shall secure the windows tightly shut, shall be easily operated, and shall not unlatch due to vibration during bus operation. The

latches shall be made of non-corrosive materials and be designed for minimal maintenance needs.

H. Gauges

Chassis Original Equipment Manufacturer (OEM) gauges shall be used in the driver's instrument cluster, but if they are not available VDO brand gauges, Stewart Warner gauges, or equal shall be used. Each bus shall have an instrument cluster with the following non-glare needle-type gauges which are easily monitored by sight from the driver's position (lights in lieu of gauges are not acceptable).

1. Voltmeter and its wiring shall be compatible with generating capacities.

2. Engine oil pressure gauge.

3. Engine coolant temperature gauge.

4. Fuel gauge.

I. Farebox

1. The farebox (a donation box is optional) shall be mounted with the trip handle toward the driver and within easy reach of the driver. The farebox shall be mounted on an adequately braced stanchion; shall be located over a flat floor surface near the driver; and shall be accessible to passengers entering bus (meet ADA requirements). An indirect farebox light shall be connected through an entrance door jamb switch to the running light circuit.

2. The farebox shall be lockable and supplied with two vaults that are interchangeable and lockable (2 keys for each lock). The vaults shall be keyed alike. The vault and farebox exteriors shall be marked with key reference. (Location shall be approved by the State at pilot model inspection.) Suggested source: Main Farebox Model M-4.

J. Bumpers

The front bumper shall be an OEM bumper. The rear bumper shall be a high energy absorbing bumper. The rear bumper shall be installed per bumper manufacturer's specification. Bumper attachment shall use a minimum of SAE grade 8 fasteners with thread locking feature or other shake-proof (Nord-Lock or equal) mounting in all attachment brackets. Rear anti-ride bumper installation shall allow space between bumper and body for energy absorption movement without body damage. Lifting pads shall be provided as part of the bus so that the bus may be lifted (at curb weight) at the front and/or the rear without any deformation or damage to the bus or bumpers and mounting hardware. Rear Bumper Suggested source: Romeo R.I.M. Inc. H.E.L.P. bumper.

K. Mud Flaps

The bus shall have commercial grade anti-sail mud flaps/splash aprons behind front and rear wheels which contain no visible imprinted logo or advertising. An inverted stainless steel "T" bracket shall be used to prevent the wind movement of the mud flap when the bus is in motion. The flaps/aprons shall be securely fastened with full width metal strips and appropriate fasteners. The flaps/aprons shall be compressed between a gauge number 11 (.125" thickness, minimum) support bracket and a gauge number 14 (.075" thickness, minimum) metal strip. The support

bracket shall be fastened securely to the body substructure or chassis frame. The flaps shall extend to within 6" of the road surface at curb weight. The mud flaps/aprons shall be at least 1" wider than the tire widths (single front, dual rear) to control splash at the rear of wheel openings. Rubber fender splash guards, secured with stainless fasteners shall be installed on all wheelwell openings. Other mud flaps/splash aprons/shields shall be installed to protect bus equipment (AC components, batteries, front wheel inner shield, auxiliary heater box, and the like) from road splash.

L. Towing

Tow hooks shall be provided with two in the rear of the bus, which shall be of sufficient strength to tow 1 1/2 times the GVWR of the bus. Tow hooks shall be easily accessed and free of interference with the bumper system when in use. Access to tow hooks may be made through holes in the bumper assembly. The intended use for tow hooks is only to safely move the bus to a point of tow truck hook-up. Tow hooks shall be installed to prevent them from dragging when the bus is driven over an incline. The tow hooks equal to Original Equipment Manufacturer (OEM) units shall be mounted and adequately secured to the chassis frame as recommended by the tow hook manufacturer or may be supplied by the OEM as standard equipment on the chassis. The bus shall be designed to be towed from the rear. A fuel tank protection frame shall not interfere with a frame contact lift. The bidder shall provide the towing and lifting procedure to be followed.

M. Undercoating/Rustproofing

1. When the unit is completed, the sections of the underside of the bus exposed to the elements shall be treated with an undercoating material except those areas of the OEM chassis where undercoating is not recommended. Undercoating shall be warranted for the same period covered by the body/structure warranty. Suggested source: Tectyl 121-B.

2. Rustproofing - All box type steel tubing (except stainless steel) used in the floor shall have the interior of the tube coated with corrosion resistant material conforming to MIL-C-62218 as outlined in Federal Standard 297E. Sections that are treated shall be properly cleaned to remove greases, oils, and residues before application of the corrosion-proofing material. All mechanisms (moving or stationary parts) that are affected by or rendered useless by an application of sealant or insulation shall be cleaned free of sealant or insulation including vent canisters and drain pipes. Rustproofing shall be warranted for the same period covered by the body/structure warranty. Suggested source: Waxoyl, Ziebart Type-A.

N. Interior Mirrors/Sunvisors

1. Interior Mirror

Interior mirror (with adjustable mounting bracket) shall be a 4" by 10", minimum, flat mirror glass with rounded corners. The driver shall be able to adjust the mirror so that the complete passenger compartment can be viewed through interior mirror. Location shall be determined at pilot model inspection. Suggested source: B&R Manufacturing, Lucerix/Metagal, Mirror Lite Co, Inc., ROSCO,.Mirror Lite Co, Inc., Manufacturer's standard.

2. Sunvisor

Windshield sun visor system shall be standard Original Equipment Manufacturer (OEM) chassis visor(s). If the OEM chassis is not equipped with a windshield sun visor, large transit-type, fully adjustable arm-type plexiglass sun visor(s) shall be provided for the driver at the windshield. Location shall be determined at pilot model inspection. Suggested source: manufacturer's standard.

O. Exterior Mirrors

1. Each bus shall be equipped with exterior left-hand and right-hand rear view mirrors of flat glass with convex mirrors (3" in diameter, minimum) attached or a combination flat/convex glass. The mirror shall contain at least 50 square inches of flat glass viewing area. Right hand mirror assembly shall be a fender ridge mount. Left hand mirror shall be a sail mount style. Suggested source: B&R Manufacturing, Lucerix/Metagal, Mirror Lite Co, Inc., ROSCO,.

2. To prevent obstructed front and right-hand view a convex 15 degree radius (curvature) exterior crossview mirror (8" minimum diameter) shall be provided on the left-hand front corner of the bus. Suggested source: Manufacturer's standard.

3. All exterior mirrors shall be constructed with high impact plastic or stainless steel housings. Mirrors shall be remote adjusting and shall move independently of the mirror housing. The mirrors shall be modular in design so that the glass can be replaced using the “twist lock” mechanism for service without removing the entire mirror assembly from the bus.

4. Mirror mountings shall be reinforced when not in a structural frame member to prevent mirror vibration, with approval by the State at the time of pilot model inspection. The mirror placement shall not obstruct driver vision nor have window divider bars between the driver and mirror face. Final location of exterior mirrors shall be determined at pilot model inspection.

P. Seats

1. Driver's Seat

a. The driver's seat shall comfortably hold and support the human body in the ergonomically correct position for driving and meet the flammability requirements of FVMSS 302. The driver's seat with arm rests (right side seat arm rest, left side door arm rest) shall have adjustments for fore and aft slide, 4" minimum travel, back recline, 20 degrees minimum, and weight range capacity up to 300 pounds. While seated, the driver shall be able to make all of these adjustments by hand without complexity, excessive effort, or being pinched. Manual operated adjustment mechanisms shall hold the adjustments and shall not be subject to inadvertent changes. The seat shall be high-backed and shall be properly aligned behind steering wheel to allow for maximum seat adjustments and operator comfort. The seat belt with shoulder harness, automatic retractor and supplemental restraint (SRS) system shall be chassis Original Equipment Manufacturer (OEM)

equipment. All seats and seat mountings shall meet applicable federal standards. Suggested source: American Seating, Freedman.

b. The driver's seat cushion shall be molded high resilient (HR) polyurethane foam padding with indentation load deflection (ILD) 35 pounds minimum, and the back cushion shall be molded or fabricated high resilient (HR) polyurethane foam padding (ILD) 25 pounds minimum. There shall be no welt or bead across the front of the seat cushion under the driver's legs. Compression to 10 percent maximum and tensile strength 15 lbs. per square inch minimum. Seat and back cushion foam shall meet the typical physical properties of ASTM D-3574 and the flammability requirements of FMVSS 302.

c. The driver's seat covering shall be gray cloth-type Woven Fabric (with flame retardant qualities) meeting the requirements listed below in All Seats, Part 4.

2. Passenger Seats

a. All passenger seats shall be mid-back and are required to meet the following:

(1) Complete White Book tests
(2) All applicable FMVSS testing including FMVSS 210
(3) Comply with cloth-type woven and vinyl fabric seat covering material test and performance criteria of the Federal Register dated October 20, 1993 (see Section IX., table 1).

b. Two passenger, forward facing seats shall be 35" minimum width with a non foam yellow, energy-absorbent, vandal-proof grab handle mounted to the top of each seat back (two per double seat). Grab handles are not required on seats that have a back against a wall.

c. Single passenger seats shall be 17 ½ " minimum width with a yellow, energy-absorbent, vandal-proof grab handle mounted to the top of the seat back.

d. Forward facing seats shall have 27" minimum knee to hip room.

e. Aisle facing seats shall have arm rests on both ends if the seat is not against a modesty panel.

f. Aisles shall not be less than 16" wide except as noted in Part 3 of this section.

g. Suggested sources: American Seating Horizon™ 8535 Mid-Back Series; C.E. White LE Series; Freedman Feather Weight.

3. Wheelchair Lift-Equipped Buses

Forward facing (double) fold-away or flip seats with seat belts shall be provided in the wheelchair securement area per seating arrangements (see Section III, Wheelchair Securement Area). All side facing seats provided shall be flip seats. Fold-away or flip seats shall include all dimensional, structural and testing requirements of the standard seat specification. Seat locking/latching devices shall be of high quality and be easy to latch and unlatch. Seats must positively latch in the seated and folded position to prevent inadvertent folding or unfolding of the seat. Any support legs resting on flooring shall be

non-marring or rest on metal plates flush mounted with flooring. All fold-away seats shall be able to pass FMVSS 210 without having to fasten additional latches or cables. All fold-away seats shall fold against the wall when wheelchair space is required (no further than 12" from wall in the vertical folded position). Seat may not extend into bus more than 37 ½" (two passenger) and 18 ½" (1 passenger) when folded down for passenger seating. Aisle space may be reduced to 14≅ inches where fold-up seating is placed on each side of the aisle or 15 ½" where placed opposite a stationary seat. The seat bottom cushion shall be a 5 degree tilt up from level, minimum, and back cushion shall be at 95 degrees, minimum. The seats shall be of the same design as the other passenger seats. All seat backs and all seat bottoms of fold-away/fold-up seats shall be covered with material matching seat cushion color and fabric. Suggested source: American Seating Horizon™ 8535 Mid-Back Series; C.E. White LE Series; Freedman Feather Weight; Braun #125.

4. All Seats

Seats shall be individually contoured to each passenger for occupant comfort and retention. Seats shall be covered with cloth-type woven fabric or vinyl fabric at the transit agency's option. Cloth-type fabric or vinyl shall completely enclose the seat cushion and the seat back. Cloth-type fabric or vinyl shall comply with test and performance criteria of the Federal Register dated October 20, 1993 (see Section IX., table 1). Seat colors shall be a tan background or grey background approved by the State.

a. Cloth-type Woven Fabric Requirements (with flame resistant qualities)

(1) Minimum weight 23 ounces per linear yard.

(2) 50,000 minimum double rubs (ASTM - 3597-77 Wyzewbeek Method).

(3) Color fastness to light 300 hours minimum (AATCC-16-1977 Carbon Arc.)

(4) Comply with cloth-type woven fabric seat material test and performance criteria of the Federal Register dated October 20, 1993 (see Section IX., table 1).

(5) Comply with California BLT-117.

(6) All cloth-type woven fabrics except Holdsworth Wool shall be treated with a flame proofing solution following the manufacturer's specifications, No-Flame by Amalgamated Chemical Inc., or equal.

(7) Suggested source: Flame Resistant Fabrics by Holdsworth Wool, or LaFrance Mills.

b. Vinyl Fabric

(1) Seat vinyl fabric shall be transportation grade expanded vinyl, 36 ounces per linear yard minimum.

(2) Seat vinyl fabric shall comply with test and performance criteria of the Federal Register dated October 20, 1993 (see Section IX., table 1).

(3) Suggested source: Flame Resistant vinyl by CMI D-90 or Omnova.

c. Seats General

(1) Seat cushion and back cushion shall be molded high resilient (HR) polyurethane foam padding. Seat cushion indentation load deflection (ILD) shall be 35 pounds minimum, with compression to 15 percent maximum, and tensile-strength of 15 minimum. Seat and back cushion shall meet the physical properties of ASTM D-3574 and the flammability requirements of FMVSS 302, minimum. The technical data sheet for the foam supplied shall be included in the bid proposal with the seat information. Suggested source: Manufacturer's standard.

(2) The seating arrangements and configuration shall be furnished by the State. The first double seat on the passenger side of the bus shall have an integrated child restraint seat capable of safely carrying children of 20 to 50 pounds.

(3) All seats shall be supported on the floor with high carbon steel support brackets. Seat frame shall be cold-roll steel tubing. Floor anchorage shall be neat and not interfere with entering and exiting the seat. All seat mounting bolts shall be a corrosion resistant coated/plated fasteners. Passenger seating floor rail/track shall not be installed in the wheelchair lift or wheelchair securement areas. The bidders shall provide certification test data that the installation of the seats, seat mountings including floor anchorage and floor fasteners shall meet all applicable FMVSS including FMVSS 207, 208, 209, and 210 for the bus model being offered in this bid. (see Section VIII. N.).

(4) Seat and back cushions shall be supported with a spring-type support system. Seat and back cushions shall be completely covered with seat cushion covering material. Seat back depth shall not exceed 3 ½" overall.

(5) All metal components of the seat assembly shall be coated with a powder coat epoxy paint finish that shall meet the following tests:

Salt Spray	1000 hrs	ASTM D117
Humidity Resistance	1000 hrs	ASTM D2247
Impact Resistance	to 80 in-lbs	ASTM D2794

All testing is to be performed on standard metal seating materials that have coating thickness of 1.3 to 1.8 mils. Certified test documents are required with bid proposal.

5. Passenger Seat Belts

The bidders shall provide certification test data that the seat belts, and the installation are in compliance with FMVSS-207, 208, 209, and 210 where applicable for the bus model being offered in this bid (see Section VIII. N.).

Two universal "Buckle Up" decals approximately 6" by 6" shall be furnished loose with each bus. Decals shall indicate that seat belt use is recommended.

All seats shall be equipped with seat belts for each designated seating position. Belts shall have:

a. The latch end of the belt will have an emergency locking retractor. The retractor will be mounted underneath the seat to the seat frame. No lap retractors.

b. A push button latch release mechanism.

Q. <u>Handrails, Stanchions</u> (Shall meet ADA regulations)

1. The handrails and stanchions shall be a minimum of 1 ¼ " outside diameter. All handrails and stanchions shall be positioned so as not to interfere with wheelchair movement and shall meet ADA requirements for position and size. All handrails and stanchions in the passenger entrance area shall be highly visible yellow in color. All other handrails and stanchions shall be brushed stainless steel. Mounting brackets and fittings shall be composed of the same kind of material used for the stanchion or handrail.

2. All handrail and stanchion mountings shall have reinforcement plates welded to or imbedded in the structure behind surface panels of sufficient size and strength. Final locations shall be determined at pilot model inspection.

3. A floor-to-ceiling vertical stanchion shall be provided in close proximity to the rear of the driver's area. A guardrail shall be provided in back of the driver's area extending from the vertical stanchion to the left side of the bus 30" plus or minus 2" above the floor. A padded modesty panel shall be provided from the guardrail to within 8" of the floor. Stanchion and guardrail shall not restrict any driver's seat adjustments.

4. A smoked plexiglass panel, 3/8" thick, shall be provided behind driver from top of the driver's seat to within 12" of bus ceiling. The panel shall not impair driver's seat adjustments. The panel shall be located to allow the driver's seat back to recline to 2" its maximum reclined adjustment with the driver's seat in the position furthest from the steering wheel. Panel may be incorporated into the stanchion and guardrail behind the driver and shall have cutouts to give hand access to the vertical stanchion.

5. Floor-to-ceiling stanchions (yellow) shall be provided near aisle on each side of front entrance.

6. Left and right side entrance handrails (yellow) shall be installed from low stepwell to floor-to-ceiling stanchions near aisle. Entrance handrails shall be positioned so passengers entering or exiting the bus will have handrail support throughout the entering/exiting process and so that articles of clothing may not become entangled in the handrail-stanchion-guardrail assemblies.

7. A guardrail (yellow) shall be provided in front of and at the rear of the front entrance steps, extending from the vertical stanchions to the right side of the bus 30" plus or minus 2" above the floor. A modesty panel (padded and vinyl clad both sides) shall be provided to the left (rear side) of the entrance from guardrail to floor (in case of lift bus, provide floor-to-ceiling stanchion to rear of platform lift with guardrail and modesty panel padded both sides, vinyl clad, with smoked plexiglass panel, 3/8" thick over the modesty panel which will prevent someone from touching the lift when it is in operation).

R. <u>Interior Lighting</u>

1. Overhead entrance and stepwell lights shall be LED and provide no less than two foot-candles of illumination on the entrance step tread, or lift or ramp with the door open. Outside light(s) shall provide at least 1 foot-candle of illumination on the street surface within 3 feet of step tread outer edge. This system shall provide illumination automatically when the door is open and meet ADA requirements.

2. Overhead entrance and stepwell lights shall be wired to and be automatically activated by a door controlled switch. Lights shall operate any time the ignition key is on and the door is opened.

3. Stepwell light shall be on the side away from wheel splash.

4. Interior lighting shall provide a minimum of two foot-candles of illumination at a reading level. Interior lighting fixtures shall be reasonably flush with the interior walls and ceiling so no hazard exists for the passengers. All lights shall have lead wire long enough to remove light at least 6" from bus for service. All interior lights shall be grounded by an in-harness ground attached in the fuse panel to a common grounding point.

5. Light installation shall be designed to illuminate the lift platform when deployed at floor level at no less than two foot-candles of illumination. Outside light(s) shall provide at least 1 foot-candle of illumination on the street surface within 3 feet of step tread outer edge. This system shall provide illumination automatically when the lift door is open and meet ADA requirements. On-off light switch shall be lift door-actuated.

S. Exterior Lighting

1. Exterior lighting shall be in accordance with Federal Motor Carrier Safety Regulations (393.11) and ADA regulations. All lights shall have the lead wires long enough to remove the light at least 6" from bus for service. All exterior lights shall be grounded by an in-harness ground attached in the fuse panel to a common grounding point. All exterior lights of the bus shall be light emitting diodes (LED) sealed lamps retained in a rubber grommet mounting except for front headlamp/turn signal assemblies. All lights shall have the mounting to body sealed to prevent moisture intrusion and grounded to the bus frame.

2. All lights in the rear panel of the bus shall be rubber grommet mounted round LED sealed lamps except the license plate light. License plate LED shall be Peterson Model M153C-MV with Peterson Model 150-40 bracket for those not mounted in the preformed recess in the rear panel. A sealed light with a weather proof connector shall be used when the preformed recess in the rear panel is used. Suggested Sources: Dialight, Grote, Peterson, Truck-Lite

3. Exterior marker lights shall be light emitting diodes (LED) (2" in diameter sealed lamp) retained in a rubber grommet mounting and conform to Federal Motor Carrier Safety Regulations Part 393. All marker lights shall have a weather proof two prong (one positive and one ground) plug-style connector with the ground wire connected to an in-harness ground attached to a common grounding point. Marker and tail lights shall be operated through a relay controlled by the headlight switch. Suggested Sources: Dialight, Grote, Optronics Peterson, Trucklite

4. Red voltage regulated LED high mount stop lamps shall be mounted centrally in the rear panel of the bus and work in conjunction with the brake lights. On buses with a rear

emergency exit door, a 6½"x2¼" minimum, oval light shall be mounted between the upper and lower windows on the exit door and a 4" round light shall be mounted on the rear of the bus body just above the rear door. On buses with a rear emergency exit window, the two 4" round lights shall be mounted on the rear of the bus body with one just below and one just above the rear emergency exit window. Final location of high mount stop lamps shall be determined at pilot model production. Suggested Sources: Command Electronics model 003-82, Dialight, Grote, Optronics, Peterson, Truck-Lite

5. Brake lights shall be red 4" round sealed voltage regulated LED lamps and shall not override hazard flashers or turn signals. Rear turn signal lamps shall be amber 4" round sealed voltage regulated LED lamps.

6. Headlights shall be Halogen lamps and the standard front park/turn lights may be a part of the OEM headlight assembly.

7. **7.** License plate mounting shall be with stainless steel screws and jack nut for securing license plate. Suggested Source: Wm. F. Hurst Co. model 6SJN

T. Safety Equipment

All safety equipment provided by the manufacturer shall be secured to each bus and be easily accessible to the driver. Location of safety equipment shall be determined at pilot model production. The safety equipment shall be:

1. One UL listed 5 pound, 2A-10BC dry chemical fire extinguisher. Fire extinguisher shall have a metal head, a gauge to indicate state of charge, and a bracket with strap for securement. Source: Manufacturer's Standard.

2. One container of bi-directional emergency reflective triangles that meets FMVSS 125.

3. One web cutter shall be provided from the supplier of the wheelchair securement belts for use in an emergency.

U. Heating/Ventilating/Air Conditioning (HVAC)

1. During normal passenger service, front and rear heavy-duty heating system shall be capable of raising the interior temperature of a bus from 0°F to 60°F at knee level (22" above the floor) throughout the interior of bus within 30 minutes from engine startup. After initial warm-up, while the bus is in passenger service, the front and rear heavy-duty heating system shall be sufficient to maintain a minimum of 64°F at knee level throughout interior of bus and at the driver's foot space when the outside temperature is 0°F. Heating system operation will be verified by the required system testing as defined in Section VII Part D. Heating/Ventilating (HV) Certification. In addition to the front heater and windshield defrosters, for increased air circulation, one 6" two speed fan with non-glare blades and body shall be mounted away from passenger and driver traffic in the driver's area near the windshield. ra Grounding for all heater fan motors shall be supplied by an in harness ground wire attached in the fuse panel to a common grounding point. All HVAC fan motors shall be supplied with proper radio frequency (RF) suppression equipment to remove two-way radio interference.

2. Front heating unit shall be automotive in-dash type (chassis Original Equipment Manufacturer (OEM) or equal) and shall be capable of delivering heat, fresh air ventilation, and air conditioning (optional) to the driver's area. The front heater shall have a temperature control valve which can be regulated from the driver's area. The driver's area shall have air circulation in each mode of defrost, heat, fresh air ventilation, and air conditioning (optional) of 125 cfm at the foot area, with a total driver's area circulation of 400 cfm minimum.

3. Rear heating unit(s) shall distribute heat in at least a 180° direction and ensure air distribution to all passenger areas of the bus interior. Heating unit(s) shall have a minimum 5/8" I.D. heater inlet and outlet ports with a BTU/hr output rating to match the specified HVAC performance requirements. Coolant flow through the heating units shall not be restricted by excessive bends or kinks in hoses or excessive lengths of hoses. Heating units shall have rubber or nylon insulator(s) between their mounting base and floor of the bus. Suggested sources: AMFAB Inc., A. R. Lintern, Bergstrom, Pro-Air.

4. The premium heater hose (5/8" ID minimum) shall be high temperature resistant Ethylene Propylene Diene Monomer (EPDM) material. Hose shall be a reinforced type with Aramid knitted fiber reinforcement between the EPDM tube and EPDM cover. Heater hose material shall be compatible with all types of coolant including long life coolant. Rated temperature limits of the hose shall be -40°F to +300°F minimum, with a burst pressure of 130 PSI minimum.

5. Manual shut off valves for the rear heater shall be placed as close to the engine as is practical. The 5/8" ID heavy-duty brass 1/4 turn ball shut off valves shall be located in the heater outlet line (from engine to heater) and in the heater inlet line (to engine from heater). Shut off valves shall be accessible by personnel without going under the bus (may require an access panel door). Location to be determined at pilot model inspection.

6. Front heater shall have coolant temperature control valve or other controls which can regulate heater temperature from the driver's area.

7. All heat lines and hoses shall: have exterior routing along the bus frame rail where possible; be sufficiently protected to ensure against wear from friction and the elements; be insulated to reduce heat loss; use routing that eliminates excessive bends and hose lengths; and have heater hose passage holes through engine cowl and floor area thoroughly sealed to prevent air, dust, and moisture intrusion.

8. Air Conditioning (see Alternate Quotes, Section VI. A).

V. <u>Windows</u>

1. Passenger compartment windows shall be T-type slider at top, full slider, or top tip-in type for window ventilation. Windows shall have double-density safety glass and heavy-duty locking features which shall meet FMVSS 217 for emergency exits, if applicable. Window glazing material shall be able to maintain its seal and glass retention for the life of the unit. Caulking around windows shall be used only as a seal, not to make up for body defects or out of tolerance window openings (maximum clearance of ¼" around the frame, $^{1}/_{8}$" on each side). All window glass shall be tinted - passenger windows AS-3 tint 31% luminous transmittance, right and left driver's side windows AS-2 tint 70% luminous transmittance, and windshield shaded-tinted AS-1 tint - and meet applicable federal

standards. Driver's compartment right and left side windows shall be designed for maximum window area to provide unobstructed vision. Driver's compartment left side window shall be adjustable vent type (moveable front section of lower portion for ventilation) or chassis Original Equipment Manufacturer (OEM) door window. Driver's right side window shall be one piece. Suggested sources: Hehr, Kinro,

W. Paint

1. All exterior surfaces shall be smooth and free of visible fasteners (excluding round head structural rivets), dents, and wrinkles. As appropriate for the paint used and prior to application of paint, the exterior surfaces to be painted shall be properly cleaned and primed to assure a proper bond between the substrate and successive coats of original paint. Paint shall be applied smoothly and evenly, with the finished surface free of dirt, runs, orange peel, and other imperfections. All exterior finished surfaces shall be impervious to diesel fuel, gasoline, and commercial cleaning agents. Finished surfaces shall not be damaged by controlled applications of commonly used graffiti-removing chemicals.

2. All exterior paint shall be a two part acrylic-urethane-type or polyurethane-type with low volatile organic compound (VOC) emission. The finish coat of paint shall be applied before rubrail covers or inserts, fender flares, exterior lights, and other body mounted accessories are installed. Paint shall be applied in the following method:

a. If on bare aluminum, use proper cleaner. Recommended sources: DuPont 2253, PPG, followed by aluminum conversion. Recommend sources: DuPont 2265, PPG.

b. If on bare steel, use proper cleaner. Recommended sources: DuPont 5717S, PPG followed with steel conversion.

c. For all bare metal, use primer. Recommended sources: DuPont Prime 615/616 (two coats), PPG.

d. Appropriate primer as required shall be used on fiberglass surfaces.

e. Coat entire prepared surface to be painted with minimum of two coats of paint properly activated and reduced and have a minimum thickness of three millimeters. Recommended sources: DuPont, PPG Concept System, Sikkens Corporation U-Tech brand.

3. Standard paint color for all buses shall be the manufacturer's pre-finished white exterior panels (OEM white). Color scheme on all buses shall be provided at the time of ordering. Additional paint schemes will be quoted in VI. ALTERNATE QUOTES (OPTIONS) Item L. Special design paint application pricing will be negotiated at the time of ordering by the transit agency.

X. Insulation

1. Inside walls, ceiling, passenger floor area, driver floor area, and fire wall area shall be adequately insulated for sub-zero winters with spray-type foam insulation or glued in place insulation with a minimum R factor of 5. The insulation shall be non-formaldehyde, fire-resistant (FMVSS 302 minimum), non-hygroscopic, and resistant to fungus.

Insulation shall prevent condensation and thoroughly seal bus so that drafts cannot be felt by the driver or passengers during operations with the passenger door closed. Insulation shall not cover up electrical wiring harnesses, electrical switches, or other devices and shall not be sprayed in wheelwells. All mechanisms (moving or stationary parts) that are affected, create a fire hazard, or are rendered useless by an application of sealant or insulation shall be cleaned free of sealant or insulation, including vent canisters and drain pipes.

2. Engine hood cover and driver's area shall have adequate insulation to keep driver's foot area cool during summer months, warm during winter months, and reduce engine noise to an acceptable level. The OEM insulation provided on the engine hood is acceptable.

Y. Type I Lift, Passive (Platform Type) (Shall Meet ADA Requirements)

1. All buses equipped with lifts must meet FMVSS 403 and 404 requirements. All costs required to meet these requirements shall be included in the bid price.

2. The Type I platform lift (passive lift) shall be installed in a separate door opening for use by persons with disabilities. The lift assembly shall be mounted within the bus body on the right (curb) side. The bus manufacturer must provide documentation (reviewed by the State at pilot model production) that the lift installation complies with the lift manufacturer's lift installation requirements. The overhead clearance between the top of the door opening and the raised lift platform, or highest point of a ramp shall be a minimum of 68" for a bus over 22 feet in length to meet ADA requirements.

3. The lift door(s) shall be manually operated with an outside key locking handle. Spring loaded struts, gas struts or manual latches shall be provided on the lift door(s) to positively hold the door(s) in the open position. All door openings shall have full structural framing around the opening equal to the structural members of the body. The lift door(s) shall have an upper window similar to the side windows of the bus. Any exposed lift door frame structure shall be constructed of 304 stainless steel acid-etched, coated with zinc based primer and powder coated OEM white (including the fasteners).

4. The lift shall be an electro-hydraulic type. If the lift has a crossbar, it shall be above the door opening and well padded. The platform lift equipment shall be a double "C" channel parallel arm construction, hydraulically operated by two single-acting cylinders with gravity unfold, gravity down, power up, and power fold (stow) operation. No part of the lift platform shall exceed 6 inches/second during the lowering and lifting of an occupant, and shall not exceed 12 inches/second during deploying or stowing. The lift shall have a mechanical outboard safety wheel stop to prevent wheelchair from rolling off the platform during the lifting cycle. Successful bidder shall deliver the lift equipped bus with the type of lift equipment requested by the State. Suggested sources: Braun, Maxon, Ricon.

5. A manual safety override shall be provided that will remain operable. Lift shall have manual override instructions visible from inside and outside the bus with door open.

6. The entire lift assembly shall be installed inside the bus body and shall have adequate protection installed on all sharp corners or items that protrude into the passenger area to prevent accidental injury to passengers. Wall and floor mounting points shall be reinforced and shall be attached with fasteners having a thread locking feature. Lift installation shall insure that no lift rattling exists when the bus is operated while the lift is stowed.

7. A lift control interlock system shall be installed that shall ensure that the bus cannot be moved when the lift is not stowed and that the lift cannot be deployed unless the interlock is engaged [to meet ADA regulation in 49 CFR Part 38, Subpart B--Buses, Vans and Systems, §38.23, (b)(2)(I)]. The interlock system shall engage when the lift operation sequence is followed. Interlock operating instructions shall be included with the bus at delivery. An indicator light (red, labeled) shall be provided at the driver's station that is activated when the lift door is open and when the lift is in operation. An interlock override system shall be installed that allows service personnel to move the bus to a safe area for repairs. Suggested Source: Intelligent Lift Interlock System (ILIS) by Intermotive Products.

8. All lift equipped buses shall display the international symbol of accessibility, one each on left and right side of the bus. Location shall be determined at pilot model inspection.

9. The passive lift shall meet ADA requirements as well as these minimum requirements.

a. Capacity 800 pounds minimum.

b. Usable platform width 33" minimum.

c. Usable platform length 50" minimum.

d. Platform shall include automatic locking inboard safety wheel stop (minimum 6" height) and outboard safety wheel stops to prevent wheelchair from rolling off.

e. Platform shall automatically stop at floor level.

f. Platform shall automatically stop when lowered to ground level.

g. Hand held controls shall be conveniently located on a flexible, cut resistant cable and shall be mounted with access from inside or outside the bus. The cable shall be routed to eliminate being pinched in any moving parts and be wrapped with a flexible exterior protective conduit.

h. Platform, bridge plate, and area between bridge plate and aisle shall be skid resistant.

i. Bridge plate and platform shall be coated to resist rust.

j. Platform shall have horizontal handrails (one each side) on platform to assist passenger during lift operations. Handrails (yellow) shall fold automatically to prevent any obstructions into the bus passenger area.

k. Lift door operated interrupt switch shall prevent use of lift with lift door(s) closed. Heavy duty long life switches shall be used in this application.

l. The color of the lift shall coordinate with bus interior colors and be approved by the State. The outside edges of the platform shall either be painted yellow or use 3M™ vinyl safety stripe tape to enhance visibility when extended on the ground.

m. Sharp corners of lift platform shall be padded (remove for lift use) when in the stored position.

n. The wheelchair lift shall comply with all federal, Americans with Disabilities Act (ADA), and Veterans' Administration regulations.

o. Lift platform shall be fitted with device to prevent the platform from touching or leaning against door after being returned to stored position when the lift assembly is not in use.

III. WHEELCHAIR SECUREMENT AREA

A. The wheelchair securement system shall be installed according to ADA requirements. Securement location shall be installed as shown by the seating plan option and approved at pilot model production. Fold-away seating shall be provided for use when wheelchairs are not being carried as shown in floor plans. The integrated securement system shall restrain the occupant and the wheelchair separately and securely.

B. Wheelchair securement shall meet these minimum requirements:

1. Forward facing wheelchair tie down and occupant restraint shall consist of four floor attachment points for the chair and a combination, lap belt/shoulder restraint with manual height adjuster for the occupant per location.

2. Securement floor anchorage points shall be anodized aluminum, stainless steel or other noncorrosive metal construction and consist of aircraft type insert pockets that can be flush mounted with the rubber flooring (Flanged “L” style track with end caps Q-Straint Q5-6100-FPD). Floor anchorage points for the first securement space shall be spaced at a minimum of 54" from front to rear. Floor anchorage points shall be located no closer than 8" from a stationary wall or obstruction (forward or rearward) that would hinder an operator from attaching the securement system. Anchorage points can be used for the front tie downs, the rear tie downs, and can be shared by the center run of anchorage track. Width of anchorage track shall be no less than 30” wide allowing for the widest of mobility devices.

3. Securement wall anchorage point for shoulder restraint shall be stainless steel or other aircraft quality noncorrosive metal. Wall anchorage device shall provide vertical adjustment (approximately 12") for differences in height of the secured mobility aid. Wall anchor shall be permanently fastened to the body structure in the wall according to the belt assembly manufacturer’s installation instructions.

4. The belt components shall be permanently marked to identify their location as follows: "floor", "lap", or "shoulder". The four belts that attach to the wheelchair from the floor anchorage points shall use a simple speed hook end (“J” or “S” style) for chair attachment and have automatic heavy duty retractors with a hard metal cover and manual knob control. All floor attachment belts shall be the same and work in any of the four floor attachment points and be equipped with connector brackets for the lap belt assembly. Automatic self tensioning and self locking retractors with metal covers shall be part of the four floor belt assemblies for automatic belt tensioning. Belt ends with floor anchor attachments shall be easily identified for placement in the floor track.

5. All belt components shall meet ADA requirements and random static testing forces equal to:

rear belt assy.	6,000 lbs. each, minimum
front belt assy.	2,000 lbs. each, minimum
lap belt assy.	2,500 lbs. each, minimum
shoulder belt assy.	2,500 lbs. each, minimum
floor insert assy.	6,000 lbs. each, minimum

6. All components shall meet SAE J2249 requirements and be 30 MPH/20G impact tested.

7. All components shall be installed to the securement manufacturer's recommended specifications.

8. Suggested sources: Sure-Lok's Retraktor™ Systems for L track; Q'Straint Model Q-8100-A1L..

C. Storage pouches shall be provided for wheelchair restraints so that the restraints can be stored off the floor in the bus when not in use. Location of storage pouches will be determined by the state at pilot model inspection.

IV. CHASSIS SPECIFICATIONS

The chassis shall have a pre-delivery inspection performed by a representative of the chassis manufacturer before the bus manufacturing process begins. A copy of the completed pre-delivery inspection form shall accompany the bare chassis during manufacture as part of the build order. All standard or optional chassis equipment to be included shall be as advertised by the manufacturer and factory installed and shall not consist of substitute or after market equipment. Optional chassis equipment not available from the factory may be dealer installed. The chassis shall meet the following minimum requirements:

A. Chassis

Commercial or Recreational Vehicle (RV) rated chassis shall be the highest Gross Vehicle Weight Rating (GVWR) available for the wheelbase and shall have one front axle with single wheels and one rear axle with dual wheels.

B. Tilt Wheel/Power Steering

Chassis shall be equipped with power steering and a tilt wheel steering column. The steering column shall be adjustable for various up and down positions of the steering wheel. The steering gear shall be a full hydraulic power assist type.

C. Wheelbase

Wheelbase shall be 158", minimum.

D. Engine

The engine shall be a gasoline V8 or V10, fuel injected, 350 CID (5.7P) minimum.

E. Transmission

Heavy-duty, four-speed automatic cooled by an external "H.D. transmission oil cooler" in series with radiator cooler or equal (cooler capacity to match GVWR of bus).

F. Alignment

The bus shall have a four wheel alignment at final point of inspection, just prior to delivery to the transit agency and a copy of the work order indicating the camber, caster, and toe-in settings at time of final inspection shall be provided with the bus at delivery.

G. Gross Vehicle Weight Rating (GVWR)

Front Axle Rating - 4,600-lb. minimum. Bus shall not exceed chassis manufacturer’s rated front axle weight capacity.

Rear Axle Rating, - 9,450-lb. minimum. Bus shall not exceed chassis manufacturer's rated rear axle weight capacity.

Chassis GVWR - 14,050-lb. minimum. (see Purpose of Specifications, Section I)

H. Differential

Heavy-duty rear axle with full floating axles. Gear ratio shall allow buses to travel approximately 65 miles m.p.h. loaded, and not exceed manufacturer's recommended engine operating R.P.M. Axles shall be marked if synthetic oil is used.

I. Battery

The battery equipment shall be furnished by the chassis manufacturer where available. The dual batteries shall be maintenance free with reserve capacity of 400 minutes @ 80° F, CCA-1250, 12-volt minimum (dual Delco Group 31-1150 series). The batteries installed in the bus must be a pair of matching units. The batteries must be fresh, fully charged units when the finished bus leaves the manufacturing plant. Batteries that have been in the bus during the manufacturing process which were allowed to become fully discharged for a period of time shall be replaced with fresh new batteries. Both batteries shall be mounted on a slide-out tray with nonmetal battery hold down secured with bolts. The tray, slides, and rollers shall be stainless steel. The slide-out tray shall be mounted on properly supported mechanism with grease fittings, all of which shall have adequate capacity to support the battery equipment. The battery slide-out tray shall allow movement to permit full service of batteries outside of the bus body. The inside of the battery compartment shall be covered with a durable insulating material to prevent electrical shorts. The totally enclosed battery compartment shall be vented and the tray shall be coated with an acid resistant coating. The battery compartment must be located below the floor line with adequate reinforcement brackets mounted to floor supports. The battery compartment shall be fitted with an insulated standard exterior access door to prevent accidental grounding with hinge and flush pull-style latch(es) (SouthCo Model #M1-61-1), which match latches on other compartment access doors. The battery box compartment must be marked to say “battery inside”.

J. Battery Cables and Grounds

Battery positive and ground cables shall be AWG size 2/0 minimum, fine stranded, flexible copper wire with permanently affixed cable connector ends with heat shrink tubing applied. All cable ends shall be fastened in a manner equal to the method used by the chassis Original Equipment Manufacturer (OEM). Positive cable ends at the battery shall use a protective cover or cap as an added insulator. Cable assemblies installed in place of chassis manufacturer's battery cables shall be sized to match the electrical system’s maximum current draw to provide proper engine starting and operation of all systems.

An additional ground of the battery cable size shall be installed between the engine and chassis frame and between the transmission case and the chassis frame. One additional ground wire of the battery cable size shall be installed between the frame rails just ahead of the rear axle. The bus body shall be properly grounded with cables to the chassis frame in at least two places. Engine, body, and equipment grounds (properly sized) shall be installed to handle subsystem electrical capacity. Lift pump motor shall be grounded directly to chassis frame using a cable of the same size as the pump motor feed wire. All exterior lights and accessories added by the body manufacturer shall be grounded by an in-harness ground attached at a common grounding point. There may be a common grounding point in the rear of the bus along with a required grounding point at the fuse panel. For all ground wire connections; 1) paint shall be removed at the grounding point to provide a cleaned surface; 2) grounding wires and cables fastened to the frame or body structure shall use a bolt with nut installed in a proper sized hole; and 3) a coating of dielectric material shall be applied to the cleaned surfaces, cable ends, bolts, and nuts where each positive or grounding cable or wire is attached.

All buses shall be supplied with proper radio frequency (RF) suppression equipment to reduce radio interference and improve radio transmission and reception performance. High corrosion resistance and high conductivity braided ground straps shall be added: between the engine and the chassis frame of 1" width, minimum; between the engine and the firewall of ½ " width, minimum; two between the frame and the body sections of ½ " width, minimum; and between the separate body sections of ½ " width, minimum. For all braided ground wire connections, paint shall be removed and a coating of dielectric material applied to the cleaned surfaces where each braided cable attaches as is required in other ground wire applications. All removable covers in the engine area including fiberglass hoods need to be shielded and RF grounded. All braided high corrosion resistance and high conductivity ground straps shall be as short as possible and shall use the negative battery cable attachment point (except those between separate body sections) as the termination point of the RF grounding.

K. <u>Alternator</u>

The alternator equipment shall be furnished by the chassis manufacturer where hot output will match system needs. This system shall be a 12-volt dual-belt drive or serpentine belt drive with internal or external voltage regulator. It shall be capable of maintaining the battery at a state of full charge under all operating conditions and equipment loads, 200 amp minimum. The alternator shall be supplied with proper radio frequency (RF) suppression equipment and have a ½" wide braided ground strap connected between the alternator frame and the engine block to reduce two-way radio interference. Any bracket modifications shall not reduce the strength of the mounting bracket. Chassis alternator equipment available that is unable to meet electrical needs may be replaced by Leece-Neville, PennTex. Any non-Original Equipment Manufacturer (OEM) alternator equipment installed on a bus by the body manufacturer shall be covered by a minimum warranty period equal to the chassis OEM alternator warranty. It is the responsibility of the manufacturer (bus supplier) to match the alternator performance to the bus's electrical system needs.

L. <u>Fast Idle</u>

The engine shall be equipped with fast idle control which includes manual and automatic control features. Fast idle shall not activate unless parking brake is set and transmission control is in neutral (N) or park (P). The control system shall have a manual switch, volt sensor, an indicator light, and activate automatically from voltage sensors. The system shall automatically deactivate when bus is shifted into gear and when the bus foundation brakes are applied. Chassis manufacturer's equipment, Advanced Fast Idle System (AFIS) by Intermotive Products, Penntex Model PX-HI-(mod no) with time out module, Vortec MD30-2500.

M. <u>Brakes</u>

Foundation brakes shall be a power-actuated four wheel disc type or a disc front/drum-type rear, anti-lock braking system. The system shall be the heaviest-duty available for stop and go operation. Brake system shall include a low brake warning system provided by chassis manufacturer.

1. Front Foundation Brakes: disc, 12.5" rotor with 45 square inches of pad lining minimum.

2. Rear Foundation Brakes: drum, 12.125" x 3.5" minimum or disc with rotor and pad of equivalent size to match axle weight rating.

3. Parking Brake - Rebuildable, heaviest-duty available from chassis manufacturer.

N. Fuel Tank

Fuel tank shall be 55-gallon minimum. On **gasoline models** where the fuel tank is mounted outboard of the chassis frame rail, the fuel tank shall have a protective cage for impact protection provided by the chassis manufacturer in compliance to regulations for school bus fuel tank impact protection. Fuel fill shall be protected from weather.

O. Hazard Flasher

Hazard flashers shall be the equipped with a dash mounted control (pull on/push off, lighted knob) switch with indicator (audible and light) and heavy duty transistorized flasher. Final location, on the dashboard, shall be determined at pilot model production by the state. Suggested sources: Hela, Signal Stat..

P. Shock Absorbers

Chassis shall have gas filled shock absorbers front and rear, most heavy-duty available from chassis manufacturer.

Q. Suspension

1. The chassis shall be equipped with a heavy-duty spring front suspension to match the specified gross axle weight rating.

2. The chassis shall be equipped with a heavy-duty rear suspension fitted with a rubber shear spring suspension that works in conjunction with the OEM chassis leaf spring suspension to match the specified gross axle weight rating. The added suspension, consisting of a spring carrier assembly, a frame hanger assembly, a cross-member tube assembly, and a carrier spring assembly, shall be installed in place of the original spring hanger and shackle assembly. The frame hanger must bolt into the existing Original Equipment Manufacturer (OEM) spring hanger holes in the frame. The added suspension system must not alter the OEM gross axle weight rating. Suggested sources: MOR/ryde® "RL" Suspension System.

R. Stabilizer

Chassis shall have suspension stabilizers as provided by chassis manufacturer.

S. Wheels

Bus wheels (6) shall be 16.0" x 6.0" minimum. Wheels shall have stainless steel or brass valve stems a minimum of 1 ½" long.

T. Tires

All tires (6) shall be from the same manufacturer and be all season, tubeless, steel radial blackwall (LT225/75Rx16E), single front, dual rear. The tires shall be the largest size available from chassis manufacturer to meet the GVW rating.

U. Drive Shaft

The drive shaft shall be OEM and have guards of sufficient strength to prevent the drive shaft from striking the floor of the bus or the ground in the event of a tube or universal joint failure. Drive shaft guards (OEM chassis equipment preferred, or installed by the chassis manufacturer) shall be secured properly and be equal in materials and design to drive shaft guarding installed on a school bus chassis.

V. Wipers/Horn

Electric wipers shall be two speed, delay style, dual jet washers (electric), with OEM standard arms and blades. The bus shall have two electric horns (high and low pitch).

W. Radiator and Cooling System

The cooling system shall have an extra cooling capacity radiator, water pump, pulley, and clutch-type fan with coolant recovery system (heavy duty installed by chassis manufacturer). Cooling system shall be winterized (minimum -35°F freezing point). Radiator removal instructions and estimated removal time shall be furnished with first bus to each agency. Coolant integrity shall be maintained throughout the manufacturing process to insure that the coolant, including additives, in the delivered bus is equal to the coolant installed at the chassis OEM factory.

X. Fluids

Fluids shall be checked and filled from inside front hood where application allows. Engine oil fill/check, transmission oil fill/check, and coolant fill/check shall be located for easy access.

Y. Engine Cover

The engine cover shall be insulated from engine heat, engine noise, and road noise. Driver's area noise level (at driver ear level) shall not exceed 82 DBA for any engine at a constant speed of 55 mph on a level roadway and shall be verified at pilot model inspection. Additional equipment added to the engine cover area shall not interfere with removal/installation of the engine cover.

Z. Exhaust System

The exhaust shall exit the rear of the bus on the street (left) side just forward of the left end of the rear bumper flush with the body. The exhaust system shall meet FMVSS §393.83 and current Environmental Protection Agency (EPA) requirements. The exhaust system must be installed to provide maximum ground clearance and departure angle at the rear of the bus.

V. OTHER ITEMS

A. Safety

The following safety items shall be provided on each bus:

1. A 12-volt 97-db sealed solid state electronic warning alarm that is readily audible from outside the bus when transmission is in reverse. The alarm shall: be steam cleanable; have passed a 1 million cycle test; and meet SAE J994, OSHA, Bureau of Mines and all State Regulations. The alarm shall be mounted with bolts and properly grounded in a protected location in the rear axle area (location shall be approved by the State). Suggested source: OEM standard.

2. The rear door shall have an audible alarm at driver area that is energized when the rear door latch handle starts to open and when the rear door is locked with the ignition in the on or accessory position.

3. A lift master switch with light (green and labeled) at driver's station, illuminated when switch is on.

4. An indicator light (red and labeled) at driver's station that is activated when lift door is open and when the lift is in operation.

5. An interlock system shall be provided to ensure that the bus cannot be moved when the lift is not stowed and that the lift cannot be deployed unless the interlock is engaged (to meet ADA regulation). The interlock system shall engage when the lift operation sequence is followed. Interlock operating instructions shall be included with each bus at delivery.

6. An automatic daytime headlight control system shall be provided. The system shall illuminate the headlights when the ignition switch is on and the headlight switch is off. The system shall activate automatically after engine start up with the headlamp switch off and shall deactivate automatically when the headlamp switch is on or the ignition switch is turned off. Suggested sources: Chassis OEM.

7. A low profile electronic strobe light (white) with a clear lens and branch guard shall be provided. The light shall meet SAE J1318 requirements and be mounted centrally on the roof of the bus approximately 6' forward of the rear of the bus. The 12 volt light shall have a control switch in the driver's area. The light shall be approximately 4" in height, produce 80 (±10) double flashes per minute, and have a light intensity of 1 million candlepower with a current draw of approximately 1 ampere. Suggested Sources: Meteorlite, Peterson, Target Tech Pulsator® 451, Truck-Lite

B. Electrical

1. Lift equipped buses shall have a circuit breaker with a manual reset in the lift feed circuit. The circuit breaker shall be mounted under the hood, with easy access, in the positive power cable leading to the lift power pack.

2. Install a 12 volt power point for hand held equipment in the driver's area.

3. All cable and wires added by the body manufacturer shall be continuous color coded and numbered or function coded. The manufacturer shall furnish complete as built wiring diagrams with integrated body and chassis wiring marked to show the codes used. Mating harnesses and harness connectors shall use matching wiring and coding unless chassis OEM wiring and coding is different from body manufacturer. The wiring shall be designed to be a "plug and play"system where the harnesses and components are fastened through common standard terminal ends and connectors.

4. Electrical panels installed by the body builders shall be located for easy access. Circuit breaker circuit protection shall be standard but blade type fuses may be used when expressly required by the component manufacturer. The master electrical panel shall use a separate "plug and play" connector and terminal system. Highest quality components available shall be used. Two spare electrical fuses that match fuses used on the bus body and chassis shall be supplied with the bus and stored in a box or spare circuit area at fuse

box. All components shall be placed on the front of the electrical panel for ease of service. Suggested sources: R.C. Tronics Incorporated

5. All wiring added to chassis fuse block shall be securely fastened to prevent wires from being knocked loose or loosening from vibration. The manufacturer shall use wire raceways where needed. Wiring, harnesses, and raceways shall be supported at regular intervals by "P" clamps, or by other supporting hangers where necessary, and routed in separate hangers from heater hoses or air conditioning hoses. Body fuse/electrical panel shall be sufficiently sealed to prevent intrusion of dirt and moisture.

6. All wiring shall be heavy-duty; be properly grounded to body frame structure and the chassis; use a common grounding point; and be adequate for electrical system capacity. All wiring passage holes through engine cowl, floor area, and other partitions shall be thoroughly sealed to prevent dust and moisture intrusion and be sufficiently protected to ensure against wear from friction and the elements.

7. All accessories and accessory electrical equipment shall be wired through a constant solenoid energized when the bus's ignition switch is in "ignition on" or "run" mode. A master switch with light in the driver's control panel shall control this constant solenoid and act as a quiet switch overriding individual switches for accessories. This master switch is wired in series with the ignition switch to control the constant solenoid. The constant solenoid shall not control headlights, taillights, emergency lights, charging system voltage regulator energizer lead, a fused power lead for the passenger door, and a fused constant power lead for all electronic control units' long term memory.

8. All control switches, relays, and circuit breakers used for the various electrical circuits shall have a current carrying capacity adequate for the circuit that they control and shall be properly marked for their function. The illuminated switch markings shall be permanent and not wear off with switch use. Control switches shall be positioned for easy access.

9. All added wiring shall be installed in a properly sized and supported split open-type loom or a properly supported raceway for protection. All wiring harnesses shall have adequate length to allow for harness flexing from supporting brackets and where harnesses connect to electrical equipment. Any wiring added by splicing into an existing chassis Original Equipment Manufacturer (OEM) harness or wire shall match modification standards set forth by the chassis manufacturer, such as Ford's QVM. Any added accessories or electrical circuits shall not interfere with nor back-feed into other electrical circuits.

10. Wiring added from OEM chassis wiring to rear lights, fuel tank, and/or other accessories shall be supported and protected from the ice and snow build-up. Wiring shall be inside bus where possible. Wiring to taillights and other exterior lights shall be long enough to remove assembly by 6" for service. Exterior connections shall be weatherproof positive lock connectors coated with dielectric grease. Suggested sources: Metri-pak, Weather-Pak.

11. Scotch lock wire connectors are not acceptable and shall not be used for wiring installation. Terminals shall be as follows:

a. Machine crimped on wire ends shall be used on all harnesses and cable assemblies used in the production of buses. Harness assemblies shall have connectors matching a mating connector where harnesses attach to other harnesses, switches, or other electrical units. Connections made in any harness assembly shall use Sta-Kon®, disconnects and splice connectors where machine applied connectors cannot be used. Connectors shall be properly crimped with Sta-Kon®, tools and covered

with heat shrink tubing. In-line fuse assemblies shall use spade type fuses in a Weather-Pak holder and shall be located for ease of service.

b. All exterior wiring connectors (plug-ins) including harnesses shall be weatherproof positive lock with the connector pins applied with the proper crimping tool (Weather-Pak, Metri-Pak). All exterior ground connections, except factory supplied braided ground straps, shall have properly applied terminal ends with heat shrink insulation applied.

VI. ALTERNATE QUOTES (OPTIONS)

A. Air Conditioning System

OPTION A

1. a. The air conditioning system (AC) shall have front and rear evaporator units. The system shall be integrated with a compatible in-dash driver's area evaporator unit and compressor (chassis OEM) capable of delivering tempered air for windshield defrosting. The systems shall use refrigerant type R-134A and be warranted from in service date for one full year, minimum. The system shall be of sufficient capacity to maintain interior temperature requirements stated in the test procedure for air conditioning systems during summer operation (see required certification in Vendor/Manufacturer Requirements, Section VII. C).

b. The front system shall be integrated with a compatible in-dash driver's area evaporator unit (complete front system may be Chassis OEM). The front system shall provide temperature control with sufficient cooling ventilators for driver comfort with no reliance on the rear system for front temperature control. Front and rear air flow and temperature shall be controlled by separate switches on the driver's control panel or dash panel. Front and rear systems shall have separate fan controls.

2. Compressor: There shall be one engine driven air conditioning compressor of nominal 10 cu. in. displacement (may be chassis OEM). Hose end metal fittings connecting hoses to the compressor shall be electro-coated steel that pass the ASTM D117 1000 hour Salt Spray test. The compressor clutch circuit shall be interrupted when abnormal pressures are detected by the pressure monitoring switches. Low pressure switch shall be located between expansion valve and compressor in the low pressure side of the system. The high pressure switch shall be located between compressor and condenser in the high pressure side of the system. Suggested sources: Carrier Transicold, American Cooling Technology, Thermo King, Trans/Air,.

3. Condenser: The system’s condenser shall be skirt mounted. The condenser fans and motors shall be enclosed within the condenser housing. The housing shall be galvannealed with heat-fused powdered epoxy coating. The condenser coil shall be a copper or aluminum tube expanded into aluminum fins and vinyl-coated. Hose end metal fittings connecting hoses to the condenser shall be electro-coated steel that pass the ASTM D117 1000 hour Salt Spray test. High pressure cut out switches shall be wired into the clutch circuit. The condensers shall be equipped with 10" axial fans dynamically balanced with permanent magnet totally enclosed motors. The condenser shall blow air on an angle down from the bus chassis to help prevent re-circulation of hot air back through the condenser core. A refrigerant dryer shall be included and a sight glass where necessary.

The condenser shall include winter guard kits approved by the State. Suggested sources for the condenser: Carrier Transicold, American Cooling Technology, Inc., Thermo King, Trans/Air.

4. Evaporator(s)

a. The front (may be chassis OEM equipment) and rear evaporator shall have three-speed or variable speed continuous duty permanently lubricated blower motors (rear blower assembly rated at 1985 CFM, minimum). The evaporator cores shall be a copper coil with aluminum fins (four rows deep, minimum), galvanized heavy-duty frame and coil end sheets with a galvannealed drain pan. The evaporator expansion valve shall have "O" ring refrigerant connections. Suggested sources: Carrier Transicold, American Cooling Technology, Inc., Thermo King, Trans/Air.

b. The driver's evaporator shall be controlled separately from the passenger area evaporator and shall have a three-speed or variable speed continuous duty permanently lubricated blower motor (may be chassis OEM equipment). The controls shall include an on/off switch and a three-speed blower switch. The in-dash unit shall not interfere with removal or replacement of the engine cover or be blocked by the entrance door control mechanism.

c. The passenger area evaporator system shall be separately controlled from a control station at the driver's position. The controls shall include an on/off switch and a three-speed or variable speed blower switch.

5. The components of the air conditioning system shall be readily accessible for maintenance. Service/charging ports shall be accessible without removing any other component or item. The refrigerant hose construction shall comply/exceed SAE specification J2064 Type D or E. The construction of the hose shall include a nylon-based thermoplastic inner liner reinforced with two separate layers of textile yarn and a cover consisting of a synthetic elastomer in order to reduce incidences of chaffing, cuts, and ruptures with adequate extra length for flexing where connected to compressors and other components. Refrigerant fitting construction shall comply/exceed SAE specification J2064 Type D or E. All refrigerant hose end fittings shall be electro-coated steel that will pass the ASTM D117 1000 hour Salt Spray test. The hose coupling end of all fittings shall include two hose barbs and two areas of elastomeric or HNBR seals. Refrigerant hose clamp construction shall; comply/exceed SAE specification J2064 Type D or E, be made of stainless steel to ensure coupling integrity, properly align hose end fitting, and clamp the hose directly over the elastomeric or HNBR seals. Refrigerant hose fittings shall be Aeroquip E-Z Clip system, Carrier/Transicold Quick-Klik system.

6. The wiring shall meet all applicable specifications (see Section V. B.). The evaporator and condenser wiring (power and ground circuits) shall be properly sized to provide full battery voltage to each electrical unit.

7. Air conditioning electrical circuits shall be protected with automatic circuit breakers or thermal relays.

OPTION B

1. Condenser: The system's condenser shall be roof mounted and meet all of the requirements

for the air conditioning system in Option A above.

2. A branch guard shall be installed to protect the roof-mounted air conditioner.

B. Manual Entrance Door

1. The manufacturer shall provide a heavy duty manually-operated passenger entrance door with control handle located in the driver's compartment within easy reach of the driver. The passenger entrance door shall not extend below the step frame. All exposed door frame structure shall be made of 304 stainless steel acid-etched, coated with zinc based primer and powder coated OEM white (including the fasteners). The door shall be located on the right side of the bus behind the right front wheel. The entrance door shall provide a 30" clear width opening, minimum, with all handrails installed. Door opening height from the top of the first step to the door header shall be a minimum of 76".

2. Passenger entrance door shall be a double-folding, split-type double leaf swing door. This door shall have a flexible soft rubber cushion on the meeting edge 12" in width, minimum. The door glass shall be see-through, tinted (AS-2) safety glass. Under all operating conditions and bus speeds, an airtight and dust-proof seal shall be formed between the door and the stepwell, between the door and body opening, and between the door leaf sections.

3. A method shall be provided to lock the bus when the bus is parked.

C. Diesel Engine

The optional engine in the diesel-powered drive train shall be an 8 cylinder (V-8 OHV) turbocharged diesel engine 6.0 litre minimum with a cold climate package. Chassis OEM electric, 110 volt, 1000 watt, engine block heater with cord and covered receptacle shall be required for all diesel engines. Driver's area noise level shall not exceed 82 decibels at a constant speed of 55 mph on a level roadway and shall be verified at pilot model inspection.

All buses with diesel engines shall be equipped with an auxiliary heater system that shall be able to preheat, provide supplemental heat, and maintain heat for the engine and interior of the bus. The auxiliary heater systems shall be supplied as a heated coolant model with a seven-day electronic timer control. The seven-day timer control shall be capable of a two hour preheat, minimum and be capable of continuous run control when the key is on with the engine running. The system control unit shall be located in the driver's area of the bus. The heater system shall be complete with all fuel and electrical controls, exhaust system, and standard warranty. The heater shall be a 12 volt unit with a fused power supply and with protection for high and low voltage conditions. The auxiliary heater system shall meet FMVSS 301 fuel system integrity requirements. The heating unit shall be fueled by the bus's primary fuel supply. The electrical connection shall be a one piece harness from the control switch to the heating unit with weather-pak or equal exterior connections.

The heated coolant model shall be a self-contained unit mounted under the bus near the rear heating unit, and connected to the heater hoses leading to the rear heating unit. It shall be in an enclosure supplied by the auxiliary heater manufacturer, be installed so that adequate ground clearance exists below the heater enclosure box, be easily accessible for servicing, be weather resistant, and be complete with mounting brackets/hardware and coolant circulator pump. The coolant circulator pump shall provide a minimum flow of 3.5 gallons per minute. The heated

coolant system units shall have safety features for temperature regulating and overheat shut down switches. A seven day digital timer shall be used to control operation. The coolant heater shall control coolant temperature up to 176°F with a high and low heat level and have a heat output of 17,000 BTU/hr minimum. The auxiliary heater exhaust shall be connected to a section of rigid exhaust pipe with a down sweep that exits just below the heater enclosure toward the rear of the bus. Suggested source: Espar Hydronic 5 (diesel heated coolant), ProHeat Products Inc., Webasto.

D. Auxiliary Air Heater System

The auxiliary air heater systems provided shall be able to preheat, provide supplemental heat, and maintain heat for the interior of the bus for all engines. The auxiliary heater systems shall be supplied as a heated air model with an on/off, variable temperature, and with a seven-day electronic timer control. The seven-day timer control shall be capable of a two hour preheat, minimum and be capable of continuous run control when the key is on with the engine running. The system control units shall be located in the driver's area of the bus. The heater system shall be complete with all fuel and electrical controls, exhaust system, and standard warranty. All heaters shall be 12 volt units with a fused power supply and with protection for high and low voltage conditions. The auxiliary heater system shall meet FMVSS 301 fuel system integrity requirements. The heating units shall be fueled by the bus's primary fuel supply--either gasoline or diesel. The electrical connection shall be a one piece harness from the control switch to the heating unit with weather-pak or equal exterior connections.

The heated air model (with mounting brackets) shall be a self-contained unit placed in the passenger area either between the bus seat and bus floor or in a clear free space in the interior of the bus (placement shall be decided at the time of installation). The heated air system shall be a variable output, multi-stage heater for all engines. The heating unit shall have, 1) 16,000 BTU heat output, minimum (high heat setting), 2) 100 CFM of air delivery, minimum, and 3) automatic cycling between heat output stages. The heating unit shall be operated from the bus driver's area control unit. The unit shall have automatic overheat protection. All heater systems' fuel and exhaust connections shall be made outside the passenger compartment of the bus. The auxiliary heater exhaust shall be connected to a section of rigid exhaust pipe with a down sweep that exits just beyond the body side. The heating unit shall be fueled from the bus's primary fuel supply--either gasoline or diesel. Suggested source: Espar Inc. D5LC/B5LC (diesel/gas, heated air) Webasto.

Option A: Provide an auxiliary air heater for a gas powered bus as specified above.

Option B: Provide an auxiliary air heater for a diesel powered bus in lieu of the auxiliary coolant heater included with the diesel option. When an auxiliary air heater is installed on diesel powered buses, the engine shall be equipped with a 1000-watt 110-120 volt-A.C. OEM installed engine block heater with cord and covered receptacle. Engine block heater electrical cord receptacle shall be mounted for convenient access and protected from the weather (location to be determined at pilot model production).

E. Power Seat Base for Driver's Seat

Provide a six-way power seat base for standard driver's seat that allows for fore and aft, up and down, front tilt and rear tilt for the driver. Suggested source: Chassis Original Equipment Manufacturer (OEM) Deluxe Power Seat Base.

F. Destination Sign

A 24-volt, solid state, LED destination sign shall be provided which meets ADA requirement (one front and on side sign). Sign shall include a 12-volt to 24-volt converter to power the sign. Sign shall be programmable using latest version of Microsoft Windows® based software. Suggested sources: Luminator VISTA, TwinVision®

G. Ceiling Handrails

1. Two full length transit-type ceiling handrails shall be provided and securely attached to roof structure. The handrails shall be a minimum of 1 1/4" outside diameter, brushed finish, stainless steel including mounting brackets and fittings. All handrails shall meet ADA requirements for position and size.

2. All handrail mountings shall have reinforcement plates welded to or imbedded in structure behind surface panels of sufficient strength to withstand passenger force. Final locations shall be determined at pilot model production.

H. Engine Shutdown System

A warning/engine shutdown system for gasoline and diesel engines which shall be capable of monitoring oil pressure, engine temperature, and engine coolant level and which shall sound an alarm and shut down the engine when: 1) low oil pressure occurs, 2) high coolant temperature occurs, or 3) low coolant level occurs. The warning/engine shutdown system shall include an audible alarm (with warning light) and visual indicator lights (oil pressure, engine temperature, and the like) in the driver's area. The visual indicator lights shall be labeled to define the source of engine shutdown as a system diagnostic aid. The low coolant probe shall not be installed in the coolant overflow/recovery container. Suggested sources: Murphy System, Chassis OEM System.

I. Donation Box

A donation box (to replace the farebox) shall be mounted on an adequately braced stanchion; shall be located over a flat floor surface near the driver; and shall be accessible to passengers entering the bus (meet ADA requirements). The lockable donation box shall be supplied with two keys. (Location shall be approved by the State at pilot model inspection.) Suggested source: Main Farebox Model C91M.

J. Farebox Electrical Prep

Electrical connections and wiring only (no farebox) along with support stanchion shall be supplied to the area where the standard farebox would be mounted (location shall be approved by the State at pilot model inspection).

K. Rear Emergency Exit Window

1. Each bus shall be equipped with a rear exit window with a minimum of 1,200 square inches of glass area. The rear window shall have a latching device for opening from inside the bus which may be quickly released but designed to offer protection against accidental release. Lever-type latches shall be used for rear emergency exit windows and shall secure the windows tightly shut, shall be easily operated, and shall not unlatch due to vibration during bus operation. The latches shall be made of non-corrosive materials and be designed for minimal maintenance needs. The rear window exit shall meet federal

requirements (FMVSS 217). The rear window exit shall have an audible alarm at the driver's area energized when the window starts to open with the ignition on. A clear full width path of 16" minimum height shall be provided to the rear exit window. No objects shall be placed in the bus which restricts passageway to the rear exit window. All emergency exits shall be marked with instructions for proper use.

2. The bus rear exit window shall have a glue-on wide angle view Fresnel lens to improve vision directly in back of bus. Minimum size shall be 80 square inches. Suggested source: Vangard made by 3M.

L. Paint - Optional Designs

1. The bus shall have an 11" belt painted stripe (no decals). An example would be: an OEM white bus with a 11" belt stripe.

2. The bus shall have the roof painted a different color. An example would be: an OEM white bus with the roof painted red.

3. The bus shall be painted a full body color, including the roof, other than OEM white. An example would be: a bus painted all red.

M. Folding Platform Passive Lift (Platform) (Meet ADA Requirements)

The folding platform lift shall meet all of the lift requirements stated in Part II, Section Y except that the lift shall have a platform that folds in the center during stowage and the lift platform is 32" usable width. The folding platform lift provides an unobstructed view from inside the bus through the lift opening. Braun Vista, Ricon KlearVue model K-5005 ADA.

N. Rear Five Place Passenger Seat

On buses with a rear exit window, forward facing seating for five passengers shall replace two double place forward facing seats at the rear wall of the passenger compartment increasing the passenger capacity by one. The five passenger seating shall be available for buses with the lift forward of the rear axle (no wheelchair lift and/or securement location at the rear of the bus). The five passenger seat shall be 88" minimum width and shall comply with all requirements specified in Section II., Part P., Item 4. and Item 5. of these specifications but without grab handles. The seats shall be of the same design and color as the other passenger seats. The seats shall be equipped with passenger seat belts.

O. Two-Way Radio Antenna/Power

All material and labor required for a pre-installation package for two-way radio equipment shall be furnished by the manufacturer. All equipment and accessories installed as part of the buses shall have no measurable radio frequency (RF) interference. All equipment installed on the bus must operate in its normal mode while radio transmissions are being made from an on board transmitter producing 100 watts or more of transmit power while operating in the range of 43 Megahertz (Mhz) to 900 Mhz. Proper RF suppression to eliminate interference shall be provided by the manufacturer in any equipment and accessories that can produce interference. The bus frame and body shall be designed to provide no measurable radio interference (shielding) for improved radio emissions and reception performance. Certification of radio reception and transmission performance by the bus manufacturer as well as locations of components for installation of the radio packages for 43 Mhz to 900 Mhz shall be completed at pilot model production.

1. Two (2) antenna mounting plates (.060" steel minimum) shall be mounted in the roof of the bus for the purpose of providing a connection to the ground plane and providing a secure mount for the antenna. On buses with a metal exterior skin, one plate shall be mounted forward of the roof escape hatch on the roof center line and the second plate shall be mounted to the left (driver's side) of the first plate just above the bus side window. For buses with FRP composite bodies, the mounting plates may be installed in the front cap of the bus--one centered in the roof section of the cap and one centered in the left (driver's) side section of the cap. Each mounting plate must be properly positioned in relation to its ground plane to ensure proper operation of an antenna installed at that mounting point. The total thickness of the exterior shell of the bus in the mounting plate area including the mounting plate shall be no more than 1/2".

2. Two (2) antenna ground planes, which are required for proper antenna operation, shall be mounted in each bus. All ground planes shall be radio frequency (RF) grounded to the nearest metal portion of the body structure using high corrosion resistance and high conductivity braided ground straps of the proper size (3/8" minimum width). Ground planes shall provide a comparable area of radio transmission coverage whether buses have a metal exterior body covering or have a FRP composite exterior. At each antenna access opening and mounting plate area, the ground planes shall be of proper size and shape for proper communication operations. The ground planes shall be a solid piece and operate over the range of frequencies from 43 Mhz to 900 Mhz. The ground plane material used by the manufacturer must be a durable material that can be connected to the antenna mounting plate and grounded to the chassis frame. The ground plane shall be of the proper size to protect passengers in the bus from unnecessary radiation from the transmitting antenna at the bus's antenna access openings.

3. A 6" high branch deflector shall be installed on the roof of the bus 6" forward of the antenna mounting area.

4. Two threaded type access holes with covers approximately 6" in diameter shall be installed at the following antenna mounting plate locations:

a. The interior ceiling forward of the roof escape hatch.

b. For buses with metal exterior skin directly to the left (driver's) side above the side window line of the bus.

c. For buses with FRP composite bodies the screw-type access holes may be installed in the front cap of the bus, one centered in the roof section of the cap and one centered in the left side section of the cap. Adequate space shall be provided between the installed access cover and the inner body to allow for routing of the antenna lead and its connections without interference.

5. A concealed thin wall plastic conduit, 5/8" I.D. minimum, (with antenna cable pull wire) shall extend from the antenna mounting plate locations (roof and above side window or in front cap) to the mounting location for the radio. When installed, the conduit shall have no sharp or right angle bends or be distorted to prevent insertion of the antenna lead. For both antenna mounting plate locations, sufficient space shall be left at each end of the conduit to allow easy removal and replacement of the devices attached to the cable. The antenna pull wire shall terminate behind the driver's seat with 2 feet of extra length extending into the bus interior.

6. 12-volt power for the two-way radio - The positive lead (red 8 ga wire fused at 40 amperes) for the radio connection shall be provided directly from the battery positive post. The ground lead (black, 8 ga) shall be connected directly to the chassis frame with a bolt and nut for fastening. Proper suppression equipment shall be incorporated in the bus's electrical system to eliminate interference with radio and television transmission and reception shall not cause interference with any electronic system on the bus. The radio power and ground leads shall terminate directly behind the driver's seat with 12 feet of extra length extending into the bus interior.

7. A split loom or other flexible wire race-way (1" minimum) shall be installed from the radio location to the dash mounted microphone control location.

8. The modesty panel behind the driver shall be used for radio mounting and shall be constructed to support 60 pounds of weight. To provide for radio mounting, a 5" minimum distance shall be provided between the driver's seat and the modesty panel when the driver's seat is in its most rearward travel position.

P. Smooth Anti-slip Flooring

1. The entire passenger area including the wheelchair securement area, entrance steps and stepwell area shall be overlaid with smooth, slip resistant flooring material. The resilient sheet flooring system (2.2 mm thickness minimum) shall be a high quality vinyl constructed with aluminum oxide , silicon carbide grains and PVC chips blended in a high quality wear layer with a non woven polyester/cellulose backing with glass fiber reinforced center scrim. The flooring shall extend up the sidewall and rear wall to the seat rail line and shall be coved at the floor/wall joint to form a smooth water tight transition. Installation of flooring must be done strictly according to the flooring manufacturer's directions using the proper accessories, tools, and adhesives. Suggested sources: Altro Transflor™ Meta, Altro Transflor™ Chroma.

2. Step treads shall be one-piece resilient sheet flooring system matching the passenger compartment flooring. All step edges (nosings of step tread material) shall have a band of bright yellow contrasting color running full width of the step. Step tread to stepwell joints shall be sealed to prevent intrusion of moisture and debris. An aisle width standee line of bright yellow contrasting color shall be in the aisle just behind stepwell (must meet ADA contrast requirement). Suggested sources: Altro Safety Step System

Q. Entrance Stepwell Heater

The entrance stepwell shall include a 12-volt electric heating element/unit for the lower step to prevent icing of entrance steps. The low voltage step heater shall consist of one or more wire elements laminated and vulcanized between two plies of .026" silicone rubber impregnated fiberglass cloth to maintain an approximate temperature of 160° F with a low temperature (30°F) sensing switch (Warm Welcome® by Lighthouse International, Ltd.). The entire lower step heating unit with power wires shall be enclosed between the stepwell and the step tread (beneath the step tread) of the lower step. Lead wires shall be loomed, supported by brackets, and protected by grommets where they pass through structure. The sensing switch (thermostat) shall be integral with the power feed wire and located outside the stepwell in a protected area under the bus or be integral with a separate short harness that plugs into the feed wire under the bus.

R. Natural Gas Application

The bus shall accept Compressed Natural Gas (CNG) or Liquified Natural Gas application if required for fleet compliance by federal Environmental Protection Agency (EPA) alternate fuel application guidelines. Availability of this option is for demonstration or experimental units only (special purchase by the State). This option will not be used in the evaluation of the total bid and is for information only.

On buses ordered with alternate fuels options (propane, CNG, etc.) auxiliary heater systems installed shall meet the same specifications for the systems operating on diesel fuel. Additionally, a diesel fuel tank shall be added with a minimum working capacity of 8 gallons with a 1 gallon reserve. All heated air models shall have a 12-volt heater booster pump (Bergstrom 863040) installed in the coolant line forward of the first rear heater. Additional equipment needed for auxiliary heater shall be included in the option.

VII. VENDOR/MANUFACTURER REQUIREMENTS

A. **Bus Information Furnished** - Bus information in this section shall be reviewed at the pre-pilot model review meeting and at final pilot model production. Bus information identified by " * " shall also be supplied with each bus at delivery where indicated. All manuals shall be provided in a hardcopy and an electronic copy (CD or DVD). The vendor/manufacturer shall maintain record or proof that all bus information was supplied to the transit agency.

1. Copy of manufacturer's statement of origin for a bus.

2.* Warranty papers for chassis, body, and additional equipment with each bus.

3.* As built drawings showing wiring schematics of all electrical circuits, body, and chassis with each bus.

4.* Operator's manual for bus and all add-on equipment with each bus.

5.* A complete set of repair manuals for the chassis and a manufacturer's parts manual for the body, and auxiliary equipment for the first bus of each model year delivered to each transit agency.

6.* Drivability and emissions manual for the first bus of each model year delivered to each transit agency.

7.* Bus operating instructions showing controls and operation on a DVD for the first bus delivered to each transit agency.

8.* Standard manufacturer's production option sheet(s)/decal(s) for chassis and body shall be installed in manufacturer's standard location, with no holes or rivets obscuring writing and numbers. Sheet shall include rear axle ratio. A paper copy of the service broadcast sheet for chassis shall also be provided with each bus.

9.* Maintenance and inspection schedule incorporating the required maintenance and inspection of the basic bus and its subsystems (i.e., wheelchair lift) with each bus.

10. Detailed description and specifications of the frame structure, roof structure, side sheathing, inside panels, with particular reference to material used.

11. Detailed drawing on how body structure is mounted on chassis frame.

12. Certification that the seating floor anchorage and floor fasteners shall meet all applicable FMVSS including FMVSS 207, 208, 209, and 210.

13.* Proof of bus suspension alignment (work order or bill) at final bus inspection and with each bus. Four wheel alignment shall include adjustments to front and rear suspension and steering parts so that axle alignment, camber, caster, and toe settings are within manufacturer's desired limits.

14.* Proof of undercoating (warranty) at final bus inspection and with each bus.

15.* Front end and rear towing instructions with each bus.

16* Wheelchair securement product instructions and training program.

B. <u>Manufacturer Quality Control</u>

Bus contractor/manufacturer shall provide a plan for quality control during bus construction and include the plan as part of the bid documents (ISO 9001:2000 Certification). Bus contractor/manufacturer shall also provide the name of the chief of quality control for bus construction.

The contractor shall establish and maintain an effective in-plant quality assurance organization. It shall be a specifically defined organization and should be directly responsible to the contractor's management and completely independent from production. The quality assurance organization shall exercise quality control over all phases of production from initiation of design through manufacture and preparation for delivery. The organization shall also control the quality of supply articles. The quality assurance organization shall verify inspection operation instructions to ascertain that the manufactured product meets all prescribed requirements. The quality assurance organization shall detect and promptly assure correction of any conditions that may result in the production of defective transit buses. These conditions may occur in design, purchases, manufacture, tests or operations that culminate in defective supplies, services, facilities, technical data, or standards. The contractor shall maintain drawings and other documentation that completely describe a qualified bus that meets all of the options and special requirements of this procurement. The quality assurance organization shall verify that each transit bus is manufactured in accordance with these controlled drawings and documentation.

The contractor shall ensure that all basic production operations, as well as other processing and fabricating, are performed under controlled conditions. Establishment of these controlled conditions shall be based on the documented work instructions, adequate production equipment, and special work environments if necessary. A system for final inspection and test of completed transit buses shall be provided by the quality assurance organization. It shall measure the overall quality of each completed bus. A system shall be maintained by the quality assurance organization for identifying the inspection status of components and completed transit buses. Identification may include cards, tags, or other quality control devices. Inspection stations shall be at the best locations to provide for the work content and characteristics to be inspected. Stations shall provide the facilities and equipment to inspect structural, electrical, hydraulic, and other components and assemblies for compliance with the design requirements. Stations shall also be at the best locations to inspect or test characteristics before they are concealed by

subsequent fabrication or assembly operations. These locations shall minimally include, as practical, under-body structure completion, body framing completion, body prior to paint preparation, water test before interior trim and insulation installation, engine installation completion, under-body dress-up and completion, bus prior to final paint touch-up, bus prior to road test, bus final road completion and presentation to resident inspectors. Tests shall be performed by the bus manufacturer to ensure that the unit is dustproof, water-tight, fumeproof, and that all bus fluids are per specifications. The quality assurance organization shall be responsible for presenting the completed bus to the resident inspectors. Sufficiently trained inspectors shall be used to ensure that all materials, components, and assemblies are inspected for conformance with the qualified bus design.

The State may be represented at the contractor's plant by resident inspectors. They shall monitor, in the contractor's plant, the manufacture of transit buses built under this procurement. The contractor shall provide office space for the resident inspectors in close proximity to the final assembly area. This office space shall be equipped with desks, chairs, outside and interplant telephones, and other items sufficient to accommodate the resident inspector staff. Inspectors shall have lifting equipment available for raising buses for under bus inspections.

C. Air Conditioning Certification

Bus manufacturer shall provide air conditioning system performance certification (conducted by an independent laboratory or testing agency and supported by documentation of the actual test on the pilot model bus) that the air conditioning system installed in the busmeets or exceeds performance levels required by these specifications.

1. The air conditioning system performance testing shall be conducted using a heating chamber of sufficient size to contain the basic bus, to heat soak the bus at 100°F for 4 hours minimum, to simulate sun load entering windshield, and to maintain 100°F exterior temperature continuously after heat soak during testing. An interior temperature of 72°F (±3°F) must be reached within 30 minutes from the beginning of the test. Engine speed shall be maintained at 1300 RPM (± 200 RPM) during the test.

2. Instrumentation for temperature monitoring of the bus interior shall be a minimum of 3 points in the passenger area 30" above the floor - one in driver's area at knee level, and one at the evaporators' air inlets and air outlets. Instrumentation and recording equipment shall be able to monitor all points, record data at one minute intervals, and print a data report.

D. Heating/Ventilating Certification

The bus manufacturer shall provide test results that certify the performance of the heating/ventilating system as installed in the bus meets or exceeds performance levels required by these specifications. The test should be conducted by an independent laboratory or testing agency and supported by documentation of the actual tests on the pilot model bus. Testing may be performed in natural cold climate conditions. Testing of the diesel engine equipped bus shall be deemed sufficient.

1. The heating system performance testing shall be conducted using a cold chamber of sufficient size to contain the basic bus; to cold soak the bus at 0ºF for 12 hours; to maintain 0ºF continuously after cold soak during testing; and be equipped with a chassis dynamometer to simulate road operation under conditions encountered in normal transit operations with a 20% load of passengers, 1 wheelchair and a bus driver. *An average*

interior temperature of 60ºF must be reached within 30 minutes from the beginning of the test. After initial warm-up while the bus is in passenger service, the front and rear heavy-duty heating system shall be sufficient to maintain a minimum of 64°F at knee level throughout interior of bus and at the driver's foot space when the outside temperature is 0°F. The test procedures shall be completed: 1) to show actual temperature rise from static parked condition; 2) to simulate an average bus route; and 3) to measure coolant flow rates in the heater circuits at idle and at operating speeds.

2. The test is to be: 1) warm-up of 15 minutes with 8 minutes @ idle and 7 minutes @ 35 mph road load; 2) idle bus, 3 minutes [passenger boarding - door open for 1 minute]; 3) run @ 25 mph for 5 minutes, run @ idle 3 minutes [passenger boarding - door open for 1 minute]; 4) run @ 25 mph for 5 minutes, run @ idle for 8 minutes [wheelchair boarding - doors open for 4 minutes]; 5) 2 cycles of run @ 25 mph for 5 minutes, idle 3 minutes [passenger boarding - door open for 1 minute]: 6) run @ 25 mph for 5 minutes, run @ idle for 8 minutes [wheelchair boarding - doors open for 4 minutes]; 7) 2 cycles of run @ 25 mph for 5 minutes, idle 3 minutes [passenger boarding - door open for 1 minute]; 8) run bus at 35 mph for 6 minutes; and 9) idle bus, 5 minutes. Total test operation cycle of 95 minutes.

3. Instrumented monitoring for the bus interior temperature shall be a minimum of 3 points located front, center, and rear in the passenger area 30" above the floor -- one in driver's area at knee level 22" above the floor, at front heater's air inlets and air outlets, and at rear heater's air inlets and air outlets. Other temperature monitoring points shall be: engine operating (coolant); engine oil; engine outlet to heater; heater return at engine or radiator; and exterior ambient. Coolant flow shall be monitored from the engine outlet to the heaters and for coolant flow through each circuit to the heater unit. Normal engine operating temperature shall be reached 30 minutes into the test and shall be maintained throughout the performance test. Supplemental heat shall be supplied to raise engine to normal operating temperature if testing conditions fail to raise the engine to normal operating temperatures at 30 minutes into the test. The standard used for this test for normal engine operating temperature is determined by the engine manufacturer's specifications. Instrumentation and recording equipment shall be able to monitor all points, record data at one minute intervals, and print a data report.

E. Purchaser Inspection

The purchaser reserves the right and shall be at liberty to inspect all material and workmanship at all times during the progress of the work, and shall have the right to reject all material and workmanship which do not conform with the specifications or accepted practice. Where a resident inspector is used, upon the request to the quality assurance supervisor, the resident inspectors shall have access to the Contractor's quality assurance files related to this procurement. These files shall include drawings, material standards, parts lists, inspection processing and records, and record of defects.

F. Warranty

Warranty shall become effective on the date the bus is placed into service based upon agency notice to contractor. Warranty service performed at the manufacturer's facilities at the manufacturer's request shall have all costs covered by the manufacturer. Warranty for the bus shall be the following as a minimum:

1. Three (3) years/36,000 miles on chassis.

2. Three (3) years/36,000 miles on transmission.

3. Three (3) years on body structure, exterior and paint.

4. Eighteen (18) months on lift.

5. All wiring shall be warranted for one (1) year from date of delivery.

6. Manufacturer's standard warranty of one (1) year 12,000 miles, minimum, on other add-on components and items.

7. The chassis, body, and all add-on components shall be warranted by the successful contractor.

G. Miscellaneous

1. The vendor shall furnish the State with the delivery schedule of chassis to vendor and a delivery date of completed buses within 30 calendar days from date of order.

2. Any in-line equipment changes shall have prior written approval of the State.

3. The vendor shall supply the bus turning radius: wheel-to-wheel and wall-to-wall.

4. The vendor shall furnish warranty procedure instructions and necessary forms used by customers to obtain necessary warranty repairs.

5. The manufacturer(s) shall produce as pilot models the first two buses ordered by the State for its transit agencies. The buses shall be: 1) one gas powered bus, 2) one diesel powered bus, 3) each lift equipped, 4) each air conditioned, and 5) each the largest sizes on request by the transit agencies. All necessary testing and equipment placement shall be performed on the pilot models before final inspection/acceptance by the State. The pilot models shall serve as a standard for the following units but shall not relieve the contractor from an obligation to manufacture all units in compliance with all specifications.

VIII. BID DOCUMENTS

The bidder shall supply a copy of the following documents with the bid quotation:

A. The Michigan Bus Specification forms completed in detail.

B. A floor plan of the bus shall be provided indicating dimensions and showing the interior layout of the bus. The plan shall include wheelchair placement, stanchion locations, engineering calculated loaded bus axle weights, and be drawn to scale for all configurations.

C. Detailed engineering drawing for the design of the entrance door and door opening device (with drawings).

D. Detailed engineering drawing for the design of the entrance step configuration (with drawings).

E. Roof, sidewall, and flooring drawings showing structure and structural specifications indicating metal size and type used. Include side sheathing and inside panels.

F. A description of the manufacturer's chassis (specifications).

G. Detailed engineering drawing on how body structure is mounted on chassis frame.

H. All bidders must supply manufacturer's technical specifications for wheelchair lifts and wheelchair restraints. Manufacturer's sales literature is acceptable if it contains the technical specifications.

I. The warranties for body, chassis, and drive train.

J. A copy of the Bus Rollover Protection Test (FMVSS 220) results of the bus offered as specified in the bid.

K. The required Federal Transit Administration (FTA) clauses shall be attached to bid quotation.

L. The technical data sheet including flammability and smoke emissions for the seat covering material supplied.

M. Seat frame Salt Spray, humidity and impact resistance tests' results

N. Certification test data showing that the seats, the seat belts, and the installation are in compliance with FMVSS-207, 208, 209, and 210 where applicable for the bus model being offered in this bid.

O. Certification that the wiring and the switches for air conditioning and all add-on components are adequate to withstand transient loads expected.

P. A copy of the dealer agreement between the Bus Manufacturer and the designated dealer.

Q. Certification that the bus model offered is a 5 year or 150,000 mile bus and will meet the requirements of Federal Register Rules and Regulations 49 CFR Part 665, Bus Testing Program. Stating from ∋ 665.13 Test Report and Manufacturer Certification, Section (b)(1), "A manufacturer of a new bus model or a bus produced with a major change in component or configuration shall provide a copy of the test report to a recipient during the point in the procurement process specified by the recipient".G:\MAF\EXTENDED\CUTAWAY\CUTAWAY SPECIFICATIONFINAL070708.DOC

IX. TABLE 1

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1. Materials tested for surface flammability should not exhibit any flaming running, or flaming dripping.

2. The surface flammability and smoke emission characteristics of seat cushion materials should be demonstrated to be permanent after testing according to ASTM D–3574 Dynamic Fatigue Tests I_s (Procedure B).

3. The surface flammability and smoke emission characteristics of a material should be demonstrated to be permanent by washing, if appropriate, according to FED–STD–191A Textile Test Method 5830.

4. The surface flammability and smoke emission characteristics of a material should be demonstrated to be permanent by dry cleaning, if appropriate, according to ASTM D–2724. Materials that cannot be washed or dry-cleaned should be so labeled, and should meet the applicable performance criteria after being cleaned as recommended by the manufacturer.

5. ASTM E–662 maximum test limits for smoke emission (specific optical density) should be measured in either the flaming or non-flaming mode, depending on which mode generates more smoke.

6. Flooring and Fire Wall assemblies should meet the performance criteria during a nominal test period determined by the transit property. The nominal test period should be twice the maximum expected period of time, under normal circumstances, for a vehicle to come to a complete, safe stop from maximum speed, plus the time necessary to evacuate all passengers from a vehicle to a safe area. The nominal test period should not be less than 15 minutes. Only one specimen need be tested. A proportional reduction may be made in dimensions of the specimen provided that it represents a true test of its ability to perform as a barrier against vehicle fires. Penetrations (ducts, piping, etc.) should be designed against acting as conduits for fire and smoke.

7. Carpeting should be tested in according with ASTM E–648 with its padding, if the padding is used in actual installation.

8. Arm rests, if foamed plastic, are tested as cushions.

9. Testing is performed without upholstery.

Definition of Terms

1. Flame spread index (I_s) as defined in ASTM E–162 is a factor derived from the rate of progress of the flame front (F) and the rate of heat liberation by the material under test (Q), such that $I_s=F_s \times Q$.

2. Specific optical density (D_s) is the optical density measured over unit path length within a chamber of unit volume produced from a specimen of unit surface area, that is irradiated by a heat flux of 2.5 watts/cm² for a specified period of time.

3. Surface flammability denotes the rate at which flames will travel along surfaces.

4. Flaming running denotes continuous flaming material leaving the site of the during material at its installed location.

5. Flaming dripping denotes periodic dripping of flaming material from the site of burning material at its installed location.

Referenced Fire Standards

The source of test procedures listed in Table 1 is as follows:

(1) Leaching Resistance of Cloth, FED–STD–191A–Textile Test Method 5830.

Availability from: General Services Administration Specifications Division, Building 197, Washington, Navy Yard, Washington, DC 20407.

(2) Federal Aviation Administration Vertical Burn Test, FAR–25–853.

Available from: Superintendent of Documents, US Government Printing Office, Washington, DC 20402.

(3) American Society for Testing Materials (ASTM)

(a) Surface Flammability of Materials Using a Radiant Heat Energy Source, ASTM E–162;

(b) Surface Flammability for Flexible Cellular Materials Using a Radiant Heat Energy Source, ASTM D–3675;

(c) Fire Tests of Building Construction and Materials, ASTM E–119;

(d) Specific Optical Density of Smoke Generated by Solid Materials, ASTM E–662;

(e) Bonded and Laminated Apparel Fabrics, ASTM D–2724;

(f) Flexible Cellular Materials—Slab, Bonded, and Molded Urethane Foams, ASTM D–3574.

Available from: American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

In all instances, the most recent issue of the document or the revision in effect at the time of request should be employed in the evaluation of the material specified herein.

Issued: October 14, 1993.

Grace Crunican,

Deputy Administrator.

[FR Doc. 93–25709 Filed 10–19–93; 8:45 am]

BILLING CODE 4910–57–P

IX. TABLE 1

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TABLE 1: RECOMMENDATIONS FOR TESTING THE FLAMMABILITY AND SMOKE EMISSION CHARACTERISTICS OF TRANSIT BUS AND VAN MATERIALS

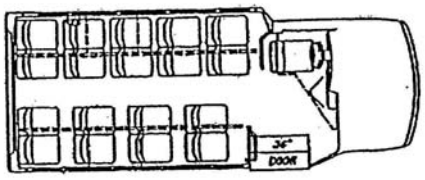
Category	Function of Material	Test Procedure	Performance Criteria
Seating	Cushion[1;2;3;5;9*]	ASTM D-3675	$I_s \leq 25$
		ASTM E-662	$D_s(1.5) \leq 100; D_s(4.0) \leq 200$
	Frame[1;5;8]	ASTM E-162	$I_s \leq 35$
		ASTM E-662	$D_s(1.5) \leq 100; D_s(4.0) \leq 200$
	Shroud[1;5]	ASTM E-162	$I_s \leq 35$
		ASTM E-662	$D_s(1.5) \leq 100; D_s(4.0) \leq 200$
	Upholstery[1;3;4;5]	FAR 25.853 (Vertical)	Flame time ≤ 10 seconds; burn length ≤ 6 inches
		ASTM E-662	$D_s(4.0) \leq 250$ coated; $D_s(4.0) \leq 100$ uncoated
Panels	Wall[1;5]	ASTM E-162	$I_s \leq 35$
		ASTM E-662	$D_s(1.5) \leq 100; D_s(4.0) \leq 200$
	Ceiling[1;5]	ASTM E-162	$I_s \leq 35$
		ASTM E-662	$D_s(1.5) \leq 100; D_s(4.0) \leq 200$
	Partition[1;5]	ASTM E-162	$I_s \leq 35$
		ASTM E-662	$D_s(1.5) \leq 100; D_s(4.0) \leq 200$
	Windscreen[1;5]	ASTM E-162	$I_s \leq 35$
		ASTM E-662	$D_s(1.5) \leq 100; D_s(4.0) \leq 200$
	HVAC Ducting[1;5]	ASTM E-162	$I_s \leq 35$
		ASTM E-662	$D_s(4.0) \leq 100$
	Light Diffuser[5]	ASTM E-162	$I_s \leq 100$
		ASTM E-662	$D_s(1.5) \leq 100; D_s(4.0) \leq 200$
Flooring	Wheel Well and Structural[6]	ASTM E-119	Pass
	Carpeting[7]	ASTM E-648	C.R.F. $\geq 0.5\ w/cm^2$
Insulation	Thermal[1;3;5]	ASTM E-162	$I_s \leq 25$
		ASTM E-662	$D_s(4.0) \leq 100$
	Acoustic[1;3;5]	ASTM E-162	$I_s \leq 25$
		ASTM E-662	$D_s(4.0) \leq 100$
Miscellaneous	Firewall[6]	ASTM E-119	Pass
	Exterior Shell[1;5]	ASTM E-162	$I_s \leq 35$
		ASTM E-662	$D_s(1.5) \leq 100; D_s(4.0) \leq 200$

* Refers to Notes on Table 1

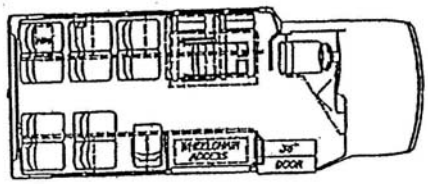
X. BUS SEATING ARRANGEMENTS

The 18-passenger non-lift bus and lift bus shall be supplied as requested in the following seating arrangements:

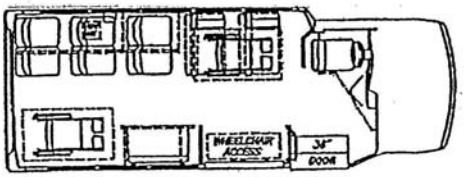
SMALL BUS FLOOR PLANS



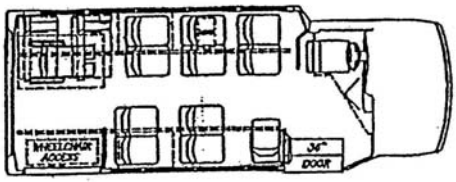
A. 18 Passenger Bus Without Lift



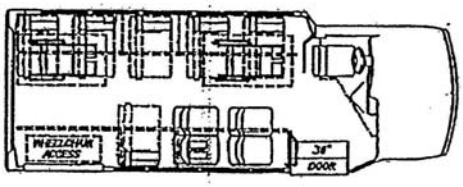
B. 11+1 Passenger Bus With Lift
Forward of Rear Axle



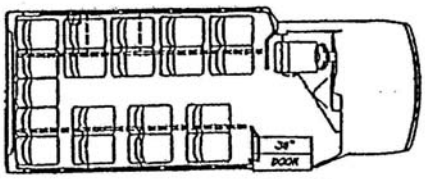
C. 8+2 Passenger Bus With Lift
Forward of Rear Axle



D. 11+1 Passenger Bus With Lift
Behind Rear Axle



E. 4+2 Passenger Bus With Lift
Behind Rear Axle



F. 19 Passenger Bus Without Lift
With 5 Place Rear Seat Option
With Rear Window Option

This specification was developed as a cooperative effort between the Michigan Department of Transportation and a committee of representatives from various Michigan Public Transit Agencies.

Upon request, this specification can be obtained in alternative format such as braille, large print, or audio tape. Contact Michael Frezell, Michigan Department of Transportation, at (517) 335-0904.

APPENDIX C
Federal Contract Clauses

APPENDIX C – FEDERAL CONTRACT CLAUSES

FEDERAL TRANSIT ADMINISTRATION

Governing Documents

Federally Required Contract Clauses (Rolling Stock)

Instructions: Return copies of these pages with your bids. Fill in parts 1, 5, 6, 7, and 21.

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1. BUY AMERICA REQUIREMENTS

The contractor agrees to comply with 49 U.S.C. 5323(j) and 49 C.F.R. Part 661, which provide that Federal funds may not be obligated unless steel, iron, and manufactured products used in FTA-funded projects are produced in the United States, unless a waiver has been granted by FTA or the product is subject to a general waiver. General waivers are listed in 49 C.F.R. 661.7, and include final assembly in the United States for 15 passenger vans and 15 passenger wagons produced by Chrysler Corporation, and microcomputer equipment and software. Separate requirements for rolling stock are set out at 49 U.S.C. 5323(j)(2)(C) and 49 C.F.R. 661.11. Rolling stock must be assembled in the United States and have a 60 percent domestic content.

A bidder or offeror must submit to the FTA recipient the appropriate Buy America certification (below) with all bids or offers on FTA-funded contracts, except those subject to a general waiver. Bids or offers that are not accompanied by a completed Buy America certification must be rejected as nonresponsive. This requirement does not apply to lower tier subcontractors.

Certification requirement for procurement of steel, iron, or manufactured products.

Certificate of Compliance with 49 U.S.C. 5323(j)(1)
The bidder or offeror hereby certifies that it will meet the requirements of 49 U.S.C. 5323(j)(1) and the applicable regulations in 49 C.F.R. Part 661.5.

Date 11/24/08

Signature

Company Name Shepard Bros., Inc.

Title Midwest Sales Manager

Certificate of Non-Compliance with 49 U.S.C. 5323(j)(1)
The bidder or offeror hereby certifies that it cannot comply with the requirements of 49 U.S.C. 5323(j)(1) and 49 C.F.R. 661.5, but it may qualify for an exception pursuant to 49 U.S.C. 5323(j)(2)(A), 5323(j)(2)(B), or 5323(j)(2)(D), and 49 C.F.R. 661.7.

Date _____

Signature _____

Company Name _____

Title _____

Certification requirement for procurement of buses, other rolling stock and associated equipment.

Certificate of Compliance with 49 U.S.C. 5323(j)(2)(C).
The bidder or offeror hereby certifies that it will comply with the requirements of 49 U.S.C. 5323(j)(2)(C) and the regulations at 49 C.F.R. Part 661.11.

Date 11/24/08

Signature

Company Name Shepard Bros., Inc.

Title Midwest Sales Manager

Certificate of Non-Compliance with 49 U.S.C. 5323(j)(2)(C)
The bidder or offeror hereby certifies that it cannot comply with the requirements of 49 U.S.C. 5323(j)(2)(C) and 49 C.F.R. 661.11, but may qualify for an exception pursuant to 49 U.S.C. 5323(j)(2)(A), 5323(j)(2)(B), or 5323(j)(2)(D), and 49 CFR 661.7.

Date _____

Signature _____

Company Name _____

Title _____

2. CARGO PREFERENCE REQUIREMENTS 46 U.S.C. 1241/46 CFR Part 381

Use of United States-Flag Vessels - The contractor agrees:

a. to use privately owned United States-Flag commercial vessels to ship at least 50 percent of the

gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to the underlying contract to the extent such vessels are available at fair and reasonable rates for United States-Flag commercial vessels;

b. to furnish within 20 working days following the date of loading for shipments originating within the United States or within 30 working days following the date of leading for shipments originating outside the United States, a legible copy of a rated, "on-board" commercial ocean bill-of -lading in English for each shipment of cargo described in the preceding paragraph to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590 and to the FTA recipient (through the contractor in the case of a subcontractor's bill-of-lading.)

c. to include these requirements in all subcontracts issued pursuant to this contract when the subcontract may involve the transport of equipment, material, or commodities by ocean vessel.

3. ENERGY CONSERVATION REQUIREMENTS 42 U.S.C. 6321 et seq./49 CFR Part 18

The contractor agrees to comply with mandatory standards and policies relating to energy efficiency which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act.

4. CLEAN WATER REQUIREMENTS 33 U.S.C. 1251

(1) The Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq. The Contractor agrees to report each violation to the Purchaser and understands and agrees that the Purchaser will, in turn, report each violation as required to assure notification to FTA and the appropriate EPA Regional Office.

(2) The Contractor also agrees to include these requirements in each subcontract exceeding $100,000 financed in whole or in part with Federal assistance provided by FTA.

5. <u>BUS TESTING</u> 49 U.S.C. 5323(c)/49 CFR Part 665

The Contractor [Manufacturer] agrees to comply with 49 U.S.C. A 5323(c) and FTA's implementing regulation at 49 CFR Part 665 and shall perform the following:

1) A manufacturer of a new bus model or a bus produced with a major change in components or configuration shall provide a copy of the final test report to the recipient at a point in the procurement process specified by the recipient which will be prior to the recipient's final acceptance of the first vehicle.
2) A manufacturer who releases a report under paragraph 1 above shall provide notice to the operator of the testing facility that the report is available to the public.
3) If the manufacturer represents that the vehicle was previously tested, the vehicle being sold should have the identical configuration and major components as the vehicle in the test report, which must be provided to the recipient prior to recipient's final acceptance of the first vehicle. If the configuration or components are not identical, the manufacturer shall provide a description of the change and the manufacturer's basis for concluding that it is not a major change requiring additional testing.
4) If the manufacturer represents that the vehicle is "grandfathered" (has been used in mass transit service in the United States before October 1, 1988, and is currently being produced without a major change in configuration or components), the manufacturer shall provide the name and address of the recipient of such a vehicle and the details of that vehicle's configuration and major components.

CERTIFICATION OF COMPLIANCE WITH FTA'S BUS TESTING REQUIREMENTS
The undersigned [Contractor/Manufacturer] certifies that the vehicle offered in this procurement complies with 49 U.S.C. A 5323(c) and FTA's implementing regulation at 49 CFR Part 665.

The undersigned understands that misrepresenting the testing status of a vehicle acquired with Federal financial assistance may subject the undersigned to civil penalties as outlined in the Department of Transportation's regulation on Program Fraud Civil Remedies, 49 CFR Part 31. In addition, the undersigned understands that FTA may suspend or debar a manufacturer under the procedures in 49 CFR Part 29.

Date 11/24/08

Signature

Company Name Shepard Bros., Inc.

Title Midwest Sales Manager

6. <u>PRE-AWARD AND POST DELIVERY AUDITS REQUIREMENTS</u> 49 U.S.C. 5323/49 CFR Part 663

The Contractor agrees to comply with 49 U.S.C. § 5323(l) and FTA's implementing regulation at 49 C.F.R. Part 663 and to submit the following certifications:

(1) Buy America Requirements: The Contractor shall complete and submit a declaration certifying either compliance or noncompliance with Buy America. If the Bidder/Offeror certifies compliance with Buy America, it shall submit documentation which lists 1) component and subcomponent parts of the rolling stock to be purchased identified by manufacturer of the parts, their country of origin and costs; and 2) the location of the final assembly point for the rolling stock, including a description of the activities that will take place at the final assembly point and the cost of final assembly.
(2) Solicitation Specification Requirements: The Contractor shall submit evidence that it will be capable of meeting the bid specifications.
(3) Federal Motor Vehicle Safety Standards (FMVSS): The Contractor shall submit 1) manufacturer's FMVSS self-certification sticker information that the vehicle complies with relevant FMVSS or 2) manufacturer's certified statement that the contracted buses will not be subject to FMVSS regulations.

BUY AMERICA CERTIFICATE OF COMPLIANCE WITH FTA REQUIREMENTS FOR BUSES, OTHER ROLLING STOCK, OR ASSOCIATED EQUIPMENT

(To be submitted with a bid or offer exceeding the small purchase threshold for Federal assistance programs, currently set at $100,000.)

<u>Certificate of Compliance</u>

The bidder hereby certifies that it will comply with the requirements of 49 U.S.C. Section 5323(j)(2)(C), Section 165(b)(3) of the Surface Transportation Assistance Act of 1982, as amended, and the regulations of 49 C.F.R. 661.11:

Date 11/24/08

Signature

Company Name Shepard Bros., Inc.

Title Midwest Sales Manager

Certificate of Non-Compliance

The bidder hereby certifies that it cannot comply with the requirements of 49 U.S.C. Section 5323(j)(2)(C) and Section 165(b)(3) of the Surface Transportation Assistance Act of 1982, as amended, but may qualify for an exception to the requirements consistent with 49 U.S.C. Sections 5323(j)(2)(B) or (j)(2)(D), Sections 165(b)(2) or (b)(4) of the Surface Transportation Assistance Act, as amended, and regulations in 49 C.F.R. 661.7.

Date: _____

Signature: _____

Company Name: _____

Title: _____

7. <u>LOBBYING</u> 31 U.S.C. 1352/49 CFR Part 19/49 CFR Part 20

Byrd Anti-Lobbying Amendment, 31 U.S.C. 1352, as amended by the Lobbying Disclosure Act of 1995, P.L. 104-65 [to be codified at 2 U.S.C. § 1601, et seq.] - Contractors who apply or bid for an award of $100,000 or more shall file the certification required by 49 CFR part 20, "New Restrictions on Lobbying." Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant or any other award covered by 31 U.S.C. 1352. Each tier shall also disclose the name of any registrant under the Lobbying Disclosure Act of 1995 who has made lobbying contacts on its behalf with non-Federal funds with respect to that Federal contract, grant or award covered by 31 U.S.C. 1352. Such disclosures are forwarded from tier to tier up to the recipient.

APPENDIX A, 49 CFR PART 20--CERTIFICATION REGARDING LOBBYING

Certification for Contracts, Grants, Loans, and Cooperative Agreements

(To be submitted with each bid or offer exceeding $100,000)

The undersigned [Contractor] certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for making lobbying contacts to an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form--LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions [as amended by "Government wide Guidance for New Restrictions on Lobbying," 61 Fed. Reg. 1413 (1/19/96). Note: Language in paragraph (2) herein has been modified in accordance with Section 10 of the Lobbying Disclosure Act of 1995 (P.L. 104-65, to be codified at 2 U.S.C. 1601, *et seq.*)]
(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31, U.S.C. § 1352 (as amended by the Lobbying Disclosure Act of 1995). Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

[Note: Pursuant to 31 U.S.C. § 1352(c)(1)-(2)(A), any person who makes a prohibited expenditure or fails to file or amend a required certification or disclosure form shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such expenditure or failure.]

The Contractor, Shepard Bros., Inc., certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. A 3801, *et seq.,* apply to this certification and disclosure, if any.

_____ Signature of Contractor's Authorized Official

Jimmie Alan Adams
Midwest Sales Manager_____ Name and Title of Contractor's Authorized Official

11/24/08_____ Date

8. ACCESS TO RECORDS AND REPORTS 49 U.S.C. 5325/18 CFR 18.36 (i)/49 CFR 633.17

The following access to records requirements apply to this Contract:

1. Where the Purchaser is not a State but a local government and is the FTA Recipient or a subgrantee of the FTA Recipient in accordance with 49 C.F.R. 18.36(i), the Contractor agrees to provide the Purchaser, the FTA Administrator, the Comptroller General of the United States or any of their authorized representatives access to any books, documents, papers and records of the Contractor which are directly pertinent to this contract for the purposes of making audits, examinations, excerpts and transcriptions. Contractor also agrees, pursuant to 49 C.F.R. 633.17 to provide the FTA Administrator or his authorized representatives including any PMO Contractor access to Contractor's records and construction sites pertaining to a major capital project, defined at 49 U.S.C. 5302(a)1, which is receiving federal financial assistance through the programs described at 49 U.S.C. 5307, 5309 or 5311.

2. Where the Purchaser is a State and is the FTA Recipient or a subgrantee of the FTA Recipient in accordance with 49 C.F.R. 633.17, Contractor agrees to provide the Purchaser, the FTA Administrator or his authorized representatives, including any PMO Contractor, access to the Contractor's records and construction sites pertaining to a major capital project, defined at 49 U.S.C. 5302(a)1, which is receiving federal financial assistance through the programs described at 49 U.S.C. 5307, 5309 or 5311. By definition, a major capital project excludes contracts of less than the simplified acquisition threshold currently set at $100,000.

3. Where the Purchaser enters into a negotiated contract for other than a small purchase or under the simplified acquisition threshold and is an institution of higher education, a hospital or other non-profit organization and is the FTA Recipient or a subgrantee of the FTA Recipient in accordance with 49 C.F.R. 19.48, Contractor agrees to provide the Purchaser, FTA Administrator, the Comptroller General of the United States or any of their duly authorized representatives with access to any books, documents, papers and record of the Contractor which are directly pertinent to this contract for the purposes of making audits, examinations, excerpts and transcriptions.

4. Where any Purchaser which is the FTA Recipient or a subgrantee of the FTA Recipient in accordance with 49 U.S.C. 5325(a) enters into a contract for a capital project or improvement (defined at 49 U.S.C. 5302(a)1) through other than competitive bidding, the Contractor shall make available records related to the contract to the Purchaser, the Secretary of Transportation and the Comptroller General or any authorized officer or employee of any of them for the purposes of conducting an audit and inspection.

5. The Contractor agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.

6. The Contractor agrees to maintain all books, records, accounts and reports required under this contract for a period of not less than three years after the date of termination or expiration of this contract, except in the event of litigation or settlement of claims arising from the performance of this contract, in which case Contractor agrees to maintain same until the Purchaser, the FTA Administrator, the Comptroller General, or any of their duly authorized representatives, have disposed of all such litigation, appeals, claims or exceptions related thereto. Reference 49 CFR 18.39(i)(11).

7. FTA does not require the inclusion of these requirements in subcontracts.

Requirements for Access to Records and Reports by Types of Contract

Contract Characteristics		Operational Service Contract	Turnkey	Construction	Architectural Engineering	Acquisition of Rolling Stock	Professional Services
I State Grantees a. Contracts below SAT ($100,000) b. Contracts above $100,000/Capital Projects		None None unless[1] non-competitive award	Those imposed on state pass thru to Contractor	None Yes, if non-competitive award or if funded thru[2] 5307/5309/5311	None None unless non-competitive award	None None unless non-competitive award	None None unless non-competitive award
II Non State Grantees a. Contracts below SAT ($100,000) b. Contracts above $100,000/Capital Projects		Yes[3] Yes[3]	Those imposed on non-state Grantee pass thru to Contractor	Yes Yes	Yes Yes	Yes Yes	Yes Yes

Sources of Authority:
[1] 49 USC 5325 (a)
[2] 49 CFR 633.17
[3] 18 CFR 18.36 (i)

9. FEDERAL CHANGES 49 CFR Part 18

Contractor shall at all times comply with all applicable FTA regulations, policies, procedures and directives, including without limitation those listed directly or by reference in the Master Agreement between Purchaser and FTA, as they may be amended or promulgated from time to time during the term of this contract. Contractor's failure to so comply shall constitute a material breach of this contract.

10. <u>CLEAN AIR</u> 42 U.S.C. 7401 et seq/40 CFR 15.61/49 CFR Part 18

(1) The Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. §§ 7401 et seq. The Contractor agrees to report each violation to the Purchaser and understands and agrees that the Purchaser will, in turn, report each violation as required to assure notification to FTA and the appropriate EPA Regional Office.

(2) The Contractor also agrees to include these requirements in each subcontract exceeding $100,000 financed in whole or in part with Federal assistance provided by FTA.

11. <u>RECYCLED PRODUCTS</u> 42 U.S.C. 6962/40 CFR Part 247/Executive Order 12873

The contractor agrees to comply with all the requirements of Section 6002 of the Resource Conservation and Recovery Act (RCRA), as amended (42 U.S.C. 6962), including but not limited to the regulatory provisions of 40 CFR Part 247, and Executive Order 12873, as they apply to the procurement of the items designated in Subpart B of 40 CFR Part 247.

12. <u>NO GOVERNMENT OBLIGATION TO THIRD PARTIES</u>

No Obligation by the Federal Government.

(1) The Purchaser and Contractor acknowledge and agree that, notwithstanding any concurrence by the Federal Government in or approval of the solicitation or award of the underlying contract, absent the express written consent by the Federal Government, the Federal Government is not a party to this contract and shall not be subject to any obligations or liabilities to the Purchaser, Contractor, or any other party (whether or not a party to that contract) pertaining to any matter resulting from the underlying contract.

(2) The Contractor agrees to include the above clause in each subcontract financed in whole or in part with Federal assistance provided by FTA. It is further agreed that the clause shall not be modified, except to identify the subcontractor who will be subject to its provisions.

13. PROGRAM FRAUD AND FALSE OR FRAUDULENT STATEMENTS AND RELATED ACTS

31 U.S.C. 3801 et seq. /49 CFR Part 31 18 U.S.C. 1001/49 U.S.C. 5307

(1) The Contractor acknowledges that the provisions of the Program Fraud Civil Remedies Act of 1986, as amended, 31 U.S.C. § 3801 et seq. and U.S. DOT regulations, "Program Fraud Civil Remedies," 49 C.F.R. Part 31, apply to its actions pertaining to this Project. Upon execution of the underlying contract, the Contractor certifies or affirms the truthfulness and accuracy of any statement it has made, it makes, it may make, or causes to be made, pertaining to the underlying contract or the FTA assisted project for which this contract work is being performed. In addition to other penalties that may be applicable, the Contractor further acknowledges that if it makes, or causes to be made, a false, fictitious, or fraudulent claim, statement, submission, or certification, the Federal Government reserves the right to impose the penalties of the Program Fraud Civil Remedies Act of 1986 on the Contractor to the extent the Federal Government deems appropriate.

(2) The Contractor also acknowledges that if it makes, or causes to be made, a false, fictitious, or fraudulent claim, statement, submission, or certification to the Federal Government under a contract connected with a project that is financed in whole or in part with Federal assistance originally awarded by FTA under the authority of 49 U.S.C. § 5307, the Government reserves the right to impose the penalties of 18 U.S.C. § 1001 and 49 U.S.C. § 5307(n)(1) on the Contractor, to the extent the Federal Government deems appropriate.

(3) The Contractor agrees to include the above two clauses in each subcontract financed in whole or in part with Federal assistance provided by FTA. It is further agreed that the clauses shall not be modified, except to identify the subcontractor who will be subject to the provisions.

14. <u>TERMINATION</u> 49 U.S.C. Part 18/FTA Circular 4220.1E

a. Termination for Convenience (General Provision) The (Recipient) may terminate this contract, in whole or in part, at any time by written notice to the Contractor when it is in the Government's best interest. The Contractor shall be paid its costs, including contract close-out costs, and profit on work performed up to the time of termination. The Contractor shall promptly submit its termination claim to (Recipient) to be paid the Contractor. If the Contractor has any property in its possession belonging to the (Recipient), the Contractor will account for the same, and dispose of it in the manner the (Recipient) directs.

b. Termination for Default [Breach or Cause] (General Provision) If the Contractor does not deliver supplies in accordance with the contract delivery schedule, or, if the contract is for services, the Contractor fails to perform in the manner called for in the contract, or if the Contractor fails to comply with any other provisions of the contract, the (Recipient) may terminate this contract for default. Termination shall be effected by serving a notice of termination on the contractor setting forth the manner in which the Contractor is in default. The contractor will only be paid the contract price for supplies delivered and accepted, or services performed in accordance with the manner of performance set forth in the contract.
If it is later determined by the (Recipient) that the Contractor had an excusable reason for not performing, such as a strike, fire, or flood, events which are not the fault of or are beyond the control of the Contractor, the (Recipient), after setting up a new delivery of performance schedule, may allow the Contractor to continue work, or treat the termination as a termination for convenience.

c. Opportunity to Cure (General Provision) The (Recipient) in its sole discretion may, in the case of a termination for breach or default, allow the Contractor [an appropriately short period of time] in which to cure the defect. In such case, the notice of termination will state the time period in which cure is permitted and other appropriate conditions

If Contractor fails to remedy to (Recipient)'s satisfaction the breach or default of any of the terms, covenants, or conditions of this Contract within [ten (10) days] after receipt by Contractor of written notice from (Recipient) setting forth the nature of said breach or default, (Recipient) shall have the right to terminate the Contract without any further obligation to Contractor. Any such termination for default shall not in any way operate to preclude (Recipient) from also pursuing all available remedies against Contractor and its sureties for said breach or default.

d. Waiver of Remedies for any Breach In the event that (Recipient) elects to waive its remedies for any breach by Contractor of any covenant, term or condition of this Contract, such waiver by (Recipient) shall not limit (Recipient)'s remedies for any succeeding breach of that or of any other term, covenant, or condition of this Contract.

e. Termination for Convenience (Professional or Transit Service Contracts) The (Recipient), by written notice, may terminate this contract, in whole or in part, when it is in the Government's interest. If this contract is terminated, the Recipient shall be liable only for payment under the payment provisions of this contract for services rendered before the effective date of termination.

f. Termination for Default (Supplies and Service) If the Contractor fails to deliver supplies or to perform the services within the time specified in this contract or any extension or if the Contractor fails to comply with any other provisions of this contract, the (Recipient) may terminate this contract for default. The (Recipient) shall terminate by delivering to the Contractor a Notice of Termination specifying the nature of the default. The Contractor will only be paid the contract price for supplies delivered and accepted, or services performed in accordance with the manner or performance set forth in this contract.

If, after termination for failure to fulfill contract obligations, it is determined that the Contractor was not in default, the rights and obligations of the parties shall be the same as if the termination had been issued for the convenience of the Recipient.

g. Termination for Default (Transportation Services) If the Contractor fails to pick up the commodities or to perform the services, including delivery services, within the time specified in this contract or any extension or if the Contractor fails to comply with any other provisions of this contract, the (Recipient) may terminate this contract for default. The (Recipient) shall terminate by delivering to the Contractor a Notice of Termination specifying the nature of default. The Contractor will only be paid the contract price for services performed in accordance with the manner of performance set forth in this contract.

If this contract is terminated while the Contractor has possession of Recipient goods, the Contractor shall, upon direction of the (Recipient), protect and preserve the goods until surrendered to the Recipient or its agent. The Contractor and (Recipient) shall agree on payment for the preservation and protection of goods. Failure to agree on an amount will be resolved under the Dispute clause.

If, after termination for failure to fulfill contract obligations, it is determined that the Contractor was not in default, the rights and obligations of the parties shall be the same as if the termination had been issued for the convenience of the (Recipient).

h. Termination for Default (Construction) If the Contractor refuses or fails to prosecute the work or any separable part, with the diligence that will insure its completion within the time specified in this contract or any extension or fails to complete the work within this time, or if the Contractor fails to comply with any other provisions of this contract, the (Recipient) may terminate this contract for default. The (Recipient) shall terminate by delivering to the Contractor a Notice of Termination specifying the nature of the default. In this event, the Recipient may take over the work and compete it by contract or otherwise, and may take possession of and use any materials, appliances, and plant on the work site necessary for completing the work. The Contractor and its sureties shall be liable for any damage to the Recipient resulting from the Contractor's refusal or failure to complete the work within specified time, whether or not the Contractor's right to proceed with the work is terminated. This liability includes any increased costs incurred by the Recipient in completing the work.

The Contractor's right to proceed shall not be terminated nor the Contractor charged with damages under this clause if-

1. the delay in completing the work arises from unforeseeable causes beyond the control and without the fault or negligence of the Contractor. Examples of such causes include: acts of God,

acts of the Recipient, acts of another Contractor in the performance of a contract with the Recipient, epidemics, quarantine restrictions, strikes, freight embargoes; and

2. the contractor, within [10] days from the beginning of any delay, notifies the (Recipient) in writing of the causes of delay. If in the judgment of the (Recipient), the delay is excusable, the time for completing the work shall be extended. The judgment of the (Recipient) shall be final and conclusive on the parties, but subject to appeal under the Disputes clauses.
    a. If, after termination of the Contractor's right to proceed, it is determined that the Contractor was not in default, or that the delay was excusable, the rights and obligations of the parties will be the same as if the termination had been issued for the convenience of the Recipient.

i. Termination for Convenience or Default (Architect and Engineering) The (Recipient) may terminate this contract in whole or in part, for the Recipient's convenience or because of the failure of the Contractor to fulfill the contract obligations. The (Recipient) shall terminate by delivering to the Contractor a Notice of Termination specifying the nature, extent, and effective date of the termination. Upon receipt of the notice, the Contractor shall (1) immediately discontinue all services affected (unless the notice directs otherwise), and (2) deliver to the Contracting Officer all data, drawings, specifications, reports, estimates, summaries, and other information and materials accumulated in performing this contract, whether completed or in process.

If the termination is for the convenience of the Recipient, the Contracting Officer shall make an equitable adjustment in the contract price but shall allow no anticipated profit on unperformed services.

If the termination is for failure of the Contractor to fulfill the contract obligations, the Recipient may complete the work by contact or otherwise and the Contractor shall be liable for any additional cost incurred by the Recipient.

If, after termination for failure to fulfill contract obligations, it is determined that the Contractor was not in default, the rights and obligations of the parties shall be the same as if the termination had been issued for the convenience of the Recipient.

j. Termination for Convenience of Default (Cost-Type Contracts) The (Recipient) may terminate this contract, or any portion of it, by serving a notice or termination on the Contractor. The notice shall state whether the termination is for convenience of the (Recipient) or for the default of the Contractor. If the termination is for default, the notice shall state the manner in which the contractor has failed to perform the requirements of the contract. The Contractor shall account for any property in its possession paid for from funds received from the (Recipient), or property supplied to the Contractor by the (Recipient). If the termination is for default, the (Recipient) may fix the fee, if the contract provides for a fee, to be paid the contractor in proportion to the value, if any, of work performed up to the time of termination. The Contractor shall promptly submit its termination claim to the (Recipient) and the parties shall negotiate the termination settlement to be paid the Contractor.

If the termination is for the convenience of the (Recipient), the Contractor shall be paid its contract close-out costs, and a fee, if the contract provided for payment of a fee, in proportion to the work performed up to the time of termination.

If, after serving a notice of termination for default, the (Recipient) determines that the Contractor has an excusable reason for not performing, such as strike, fire, flood, events which are not the fault of and are beyond the control of the contractor, the (Recipient), after setting up a new work schedule, may allow the Contractor to continue work, or treat the termination as a termination for convenience.

15. GOVERNMENT-WIDE DEBARMENT AND SUSPENSION (NONPROCUREMENT)
49 CFR Part 29/Excutive Order 12549/Exectuve Order 12689/31 U.S.C. 6101 note (Section 2455, Public Law 103-355, 108 Stat. 3327)

Suspension and Debarment

This contract is a covered transaction for purposes of 49 CFR Part 29. As such, the contractor is required to verify that none of the contractor, its principals, as defined at 49 CFR 29.995, or affiliates, as defined at 49 CFR 29.905, are excluded or disqualified as defined at 49 CFR 29.940 and 29.945.

The contractor is required to comply with 49 CFR 29, Subpart C and must include the requirement to comply with 49 CFR 29, Subpart C in any lower tier covered transaction it enters into.

By signing and submitting its bid or proposal, the bidder or proposer certifies as follows:

The certification in this clause is a material representation of fact relied upon by the **Michigan Department of Transportation (MDOT)**. If it is later determined that the bidder or proposer knowingly rendered an erroneous certification, in addition to remedies available to **MDOT**, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment. The bidder or proposer agrees to comply with the requirements of 49 CFR 29, Subpart C while this offer is valid and throughout the period of any contract that may arise from this offer. The bidder or proposer further agrees to include a provision requiring such compliance in its lower tier covered transactions.

16. PRIVACY ACT REQUIREMENTS 5 U.S.C. 552

The following requirements apply to the Contractor and its employees that administer any system of records on behalf of the Federal Government under any contract:

(1) The Contractor agrees to comply with, and assures the compliance of its employees with, the information restrictions and other applicable requirements of the Privacy Act of 1974, 5 U.S.C. § 552a. Among other things, the Contractor agrees to obtain the express consent of the Federal Government before the Contractor or its employees operate a system of records on behalf of the Federal Government. The Contractor understands that the requirements of the Privacy Act, including the civil

and criminal penalties for violation of that Act, apply to those individuals involved, and that failure to comply with the terms of the Privacy Act may result in termination of the underlying contract.
(2) The Contractor also agrees to include these requirements in each subcontract to administer any system of records on behalf of the Federal Government financed in whole or in part with Federal assistance provided by FTA.

17. CIVIL RIGHTS REQUIREMENTS 29 U.S.C. § 623, 42 U.S.C. § 2000/42 U.S.C. § 6102, 42 U.S.C. § 12112/42 U.S.C. § 12132, 49 U.S.C. § 5332/29 CFR Part 1630/41 CFR Parts 60 et seq.

The following requirements apply to the underlying contract:

(1) Nondiscrimination - In accordance with Title VI of the Civil Rights Act, as amended, 42 U.S.C. § 2000d, section 303 of the Age Discrimination Act of 1975, as amended, 42 U.S.C. § 6102, section 202 of the Americans with Disabilities Act of 1990, 42 U.S.C. § 12132, and Federal transit law at 49 U.S.C. § 5332, the Contractor agrees that it will not discriminate against any employee or applicant for employment because of race, color, creed, national origin, sex, age, or disability. In addition, the Contractor agrees to comply with applicable Federal implementing regulations and other implementing requirements FTA may issue.

(2) Equal Employment Opportunity - The following equal employment opportunity requirements apply to the underlying contract:

(a) Race, Color, Creed, National Origin, Sex - In accordance with Title VII of the Civil Rights Act, as amended, 42 U.S.C. § 2000e, and Federal transit laws at 49 U.S.C. § 5332, the Contractor agrees to comply with all applicable equal employment opportunity requirements of U.S. Department of Labor (U.S. DOL) regulations, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor," 41 C.F.R. Parts 60 et seq., (which implement Executive Order No. 11246, "Equal Employment Opportunity," as amended by Executive Order No. 11375, "Amending Executive Order 11246 Relating to Equal Employment Opportunity," 42 U.S.C. § 2000e note), and with any applicable Federal statutes, executive orders, regulations, and Federal policies that may in the future affect construction activities undertaken in the course of the Project. The Contractor agrees to take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, creed, national origin, sex, or age. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.

(b) Age - In accordance with section 4 of the Age Discrimination in Employment Act of 1967, as amended, 29 U.S.C. § § 623 and Federal transit law at 49 U.S.C. § 5332, the Contractor agrees to refrain from discrimination against present and prospective employees for reason of age. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.

(c) Disabilities - In accordance with section 102 of the Americans with Disabilities Act, as amended, 42 U.S.C. § 12112, the Contractor agrees that it will comply with the requirements of U.S. Equal Employment Opportunity Commission, "Regulations to Implement the Equal Employment Provisions of

the Americans with Disabilities Act," 29 C.F.R. Part 1630, pertaining to employment of persons with disabilities. In addition, the Contractor agrees to comply with any implementing requirements FTA may issue.

(3) The Contractor also agrees to include these requirements in each subcontract financed in whole or in part with Federal assistance provided by FTA, modified only if necessary to identify the affected parties.

18. BREACHES AND DISPUTE RESOLUTION 49 CFR Part 18/FTA Circular 4220.1E

Disputes - Disputes arising in the performance of this Contract which are not resolved by agreement of the parties shall be decided in writing by the authorized representative of (Recipient)'s [title of employee]. This decision shall be final and conclusive unless within [ten (10)] days from the date of receipt of its copy, the Contractor mails or otherwise furnishes a written appeal to the [title of employee]. In connection with any such appeal, the Contractor shall be afforded an opportunity to be heard and to offer evidence in support of its position. The decision of the [title of employee] shall be binding upon the Contractor and the Contractor shall abide be the decision.

Performance During Dispute - Unless otherwise directed by (Recipient), Contractor shall continue performance under this Contract while matters in dispute are being resolved.

Claims for Damages - Should either party to the Contract suffer injury or damage to person or property because of any act or omission of the party or of any of his employees, agents or others for whose acts he is legally liable, a claim for damages therefor shall be made in writing to such other party within a reasonable time after the first observance of such injury of damage.

Remedies - Unless this contract provides otherwise, all claims, counterclaims, disputes and other matters in question between the (Recipient) and the Contractor arising out of or relating to this agreement or its breach will be decided by arbitration if the parties mutually agree, or in a court of competent jurisdiction within the State in which the (Recipient) is located.

Rights and Remedies - The duties and obligations imposed by the Contract Documents and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law. No action or failure to act by the (Recipient), (Architect) or Contractor shall constitute a waiver of any right or duty afforded any of them under the Contract, nor shall any such action or failure to act constitute an approval of or acquiescence in any breach thereunder, except as may be specifically agreed in writing.

19. <u>TRANSIT EMPLOYEE PROTECTIVE AGREEMENTS</u> 49 U.S.C. § 5310, § 5311, and § 5333/29 CFR Part 215

(1) The Contractor agrees to comply with applicable transit employee protective requirements as follows:

(a) <u>General Transit Employee Protective Requirements</u> - To the extent that FTA determines that transit operations are involved, the Contractor agrees to carry out the transit operations work on the underlying contract in compliance with terms and conditions determined by the U.S. Secretary of Labor to be fair and equitable to protect the interests of employees employed under this contract and to meet the employee protective requirements of 49 U.S.C. A 5333(b), and U.S. DOL guidelines at 29 C.F.R. Part 215, and any amendments thereto. These terms and conditions are identified in the letter of certification from the U.S. DOL to FTA applicable to the FTA Recipient's project from which Federal assistance is provided to support work on the underlying contract. The Contractor agrees to carry out that work in compliance with the conditions stated in that U.S. DOL letter. The requirements of this subsection (1), however, do not apply to any contract financed with Federal assistance provided by FTA either for projects for elderly individuals and individuals with disabilities authorized by 49 U.S.C. § 5310(a)(2), or for projects for nonurbanized areas authorized by 49 U.S.C. § 5311. Alternate provisions for those projects are set forth in subsections (b) and (c) of this clause.

(b) <u>Transit Employee Protective Requirements for Projects Authorized by 49 U.S.C. § 5310(a)(2) for Elderly Individuals and Individuals with Disabilities</u> - If the contract involves transit operations financed in whole or in part with Federal assistance authorized by 49 U.S.C. § 5310(a)(2), and if the U.S. Secretary of Transportation has determined or determines in the future that the employee protective requirements of 49 U.S.C. § 5333(b) are necessary or appropriate for the state and the public body subrecipient for which work is performed on the underlying contract, the Contractor agrees to carry out the Project in compliance with the terms and conditions determined by the U.S. Secretary of Labor to meet the requirements of 49 U.S.C. § 5333(b), U.S. DOL guidelines at 29 C.F.R. Part 215, and any amendments thereto. These terms and conditions are identified in the U.S. DOL's letter of certification to FTA, the date of which is set forth Grant Agreement or Cooperative Agreement with the state. The Contractor agrees to perform transit operations in connection with the underlying contract in compliance with the conditions stated in that U.S. DOL letter.

(c) Transit Employee Protective Requirements for Projects Authorized by 49 U.S.C. § 5311 in Nonurbanized Areas - If the contract involves transit operations financed in whole or in part with Federal assistance authorized by 49 U.S.C. § 5311, the Contractor agrees to comply with the terms and conditions of the Special Warranty for the Nonurbanized Area Program agreed to by the U.S. Secretaries of Transportation and Labor, dated May 31, 1979, and the procedures implemented by U.S. DOL or any revision thereto.

(2) The Contractor also agrees to include the any applicable requirements in each subcontract involving transit operations financed in whole or in part with Federal assistance provided by FTA.

20. DISADVANTAGED BUSINESS ENTERPRISE (DBE) 49 CFR Part 26

a. The contractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of this U.S. DOT-assisted contract. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the **Michigan Department of Transportation (MDOT)** deems appropriate. Each subcontract the contractor signs with a subcontractor must include the assurance in this paragraph (*see* 49 CFR 26.13(b)).

b. This contract is subject to the requirements of Title 49, Code of Federal Regulations, Part 26, *Participation by Disadvantaged Business Enterprises in Department of Transportation Financial Assistance Programs.* Each subcontract the contractor signs with a subcontractor must include the assurance in this paragraph (*see* 49 CFR 26.13(b)).
Accordingly, as a condition of permission to bid, a certification must be completed and submitted with the bid. A bid which does not include certification may not be considered.

21. DBE TRANSIT VEHICLE MANUFACTURER CERTIFICATION

Coach & Equipment / Shepard Bros., Inc.__(Name of Firm), a TVM, hereby certifies that it has complied with the requirement of Section 26.49 of 49 CFR, Part 26 by submitting a current annual DBE goal to FTA. The goals apply to Federal Fiscal Year _2009_ (October 1, _2008_ to September 30, _2009_) and have been approved or not disapproved by FTA.
_Shepard Bros., Inc.__(Name of Firm), hereby certifies that the manufacturer of the transit vehicle to be supplied _Coach & Equipment Manufacturing Corp._ (Name of Manufacturer) has complied with the above referenced requirement of Section 26.49 of 49 CFR Part 26.

Signature: _____

Date: _November 24, 2008__

Title: __Midwest Sales Manager_____

Firm: __Shepard Bros., Inc._____

22. INCORPORATION OF FEDERAL TRANSIT ADMINISTRATION (FTA) TERMS

FTA Circular 4220.1E

The preceding provisions include, in part, certain Standard Terms and Conditions required by U.S. DOT, whether or not expressly set forth in the preceding contract provisions. All contractual provisions required by U.S. DOT, as set forth in FTA Circular 4220.1E, are hereby incorporated by reference. Anything to the contrary herein notwithstanding, all FTA mandated terms shall be deemed to control in the event of a conflict with other provisions contained in this Agreement. The Contractor shall not perform any act, fail to perform any act, or refuse to comply with any (name of grantee) requests which would cause (name of grantee) to be in violation of the FTA terms and conditions.

APPENDIX D
Transit Agency Address/Phone Numbers

7/3/2008

Transit Agency Address/Phone Numbers

Lenawee

MS. MARCIA BOHANNON
Adrian Dial-A-Ride
100 E. Church Street
Adrian, MI 49221

Telephone No.: (517) 264-4849 Fax No.:(517) 265-8133 Email: MarciaB@ci.adrian.mi.us

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Allegan

MR. DANIEL WEDGE
Allegan County - Transportation Services
3255 122nd Avenue, Suite 200
Allegan, MI 49010

Telephone No.: (269) 686-4529 Fax No.:(269) 673-4172 Email: dwedge@allegancounty.org

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Allegan

MS. WENDY ADRIANSON
Allegan County CMH
3283 122nd Ave.
P.O. Drawer 130
Allegan, MI 49010

Telephone No.: (269) 673-3400 Fax No.:(269) 686-5201 Email:

Gratiot

MR. RANDY SUMNER
Alma Dial-A-Ride
City of Alma Transit Center, 219 N. State Street, PO Box 278
Alma, MI 48801-0278

Telephone No.: 989 463-6016 Fax No.:989 466-5307 Email: rsumner@ci.alma.mi.us

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Alger

MS. ROCHELLE COTEY
ALTRAN Transit Authority
P.O. Box 69
Munising, MI 49862

Telephone No.: (906) 387-4845 Fax No.:(906) 387-2963 Email: altranco@jamadots.com

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Kent

MS. LISA MARKS
American Red Cross Of West Central Michigan
1050 Fuller NE
Grand Rapids, MI 49503

Telephone No.: (616) 456-8661 Fax No.:(616) 235-2355 Email: tslaughter@ggr.redcross.org

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Muskegon

MS. LOIS BRINKS
American Red Cross Serving Muskegon, Oceana and Newaygo Counti
313 W. Webster Avenue
Muskegon, MI 49440

Telephone No.: 231 726-3555 Fax No.:231 722-4126 Email: brinksl@arcmon.org

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7/3/2008

Transit Agency Address/Phone Numbers

Washtenaw

MS. DAWN GABAY
Ann Arbor Transportation Authority
2700 S. Industrial Hwy.
Ann Arbor, MI 48104

Telephone No.: (734) 973-6500 Fax No.:(734) 973-6338 Email: cwhite@theride.org

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Antrim

MR. SHERIDAN RHOADS
Antrim County Transportation
P.O. Box 120
Bellaire, MI 49615

Telephone No.: (231) 533-8644 Fax No.:(231) 533-8504 Email: rhoadss@antrimcounty.org

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Kent

MS. BEVERLY DRAKE
Area Community Service Employ. and Trng.
215 Straight St N.W.
Grand Rapids, MI 49504

Telephone No.: 616 336-4104 Fax No.:616-336-4193 Email: gpattok@acset.org

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Houghton

MS. JEAN LABERGE
Baraga/Houghton/Keweenaw CAA
926 Dodge Street
Houghton, MI 49931

Telephone No.: (906) 482-5528 Fax No.:(906)482-5512 Email: bhkcaa@att.net.

Baraga

MS. PAMELA ANDERSON
Baragaland Senior Citizen, Inc.
Six North Main Street
L'Anse, MI 49946

Telephone No.: (906) 524-6711 Fax No.:(906) 524-6922 Email: bscinc@up.net

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Barry

MR. JOSEPH BLEAM
Barry County Transit
1216 W. State St.
Hastings, MI 49058

Telephone No.: (269) 948-8174 Fax No.:(269) 948-8154 Email: joeblm@yahoo.com

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Calhoun

MR. JERRY HUTCHISON
Battle Creek Transit
339 West Michigan Ave.
Battle Creek, MI 49017

Telephone No.: (269) 966-3477 Fax No.:(269) 966-3652 Email: jphutchison@ci.battle-creek.mi.us

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7/3/2008

Transit Agency Address/Phone Numbers

Grand Traverse

MR. DON SCHARMEN
Bay Area Transportation Authority
3233 Cass Road
Traverse City, MI 49684

Telephone No.: (231) 933-5540 Fax No.: (231) 941-9091 Email: scharmend@bata.net

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Bay

MR. MIKE STONER
Bay Metro Transportation Authority
1510 North Johnson
Bay City, MI 48708

Telephone No.: 989 894-2900 Fax No.: 989 894-2621 Email: mstoner@baymetro.com

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Charlevoix

MS. BARBARA SCHWARTZFISHER
Beaver Island Transportation Authority
P.O. Box 426
Beaver Island, MI 49782

Telephone No.: (231) 448-3049 Fax No.: 231-448-3120 Email: bitaboat@biip.net

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Ionia

MS. SUZANNE CHRISTENSEN
Belding Dial-A-Ride
Pere Marquette Depot
100 Depot Street
Belding, MI 48809

Telephone No.: (616) 794-3278 Fax No.: (616) 794-4817 Email: dialaride@ci.belding.mi.us

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Benzie

MS. DEBBIE SEVER
Benzie County COA
10542 Main Street, P.O. Box 337
Honor, MI 49640

Telephone No.: (231) 325-4851 Fax No.: (231)325-4855 Email: dksever@centurytel.net

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Benzie

MS. SUSAN MILLER
Benzie Transportation Authority
12762 Honor Hwy
P.O. Box 341
Honor, MI 49640

Telephone No.: (231) 325-3000 Fax No.: (231)325-3007 Email: smillerbenziebus@charterinternet.com

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Berrien

MR. DENNIS SCHUH
Berrien County
701 Main Street
St. Joseph, MI 49085

Telephone No.: (269) 983-7111 Fax No.: (269) 982-8611 Email: dschuh@berriencounty.org

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7/3/2008

Transit Agency Address/Phone Numbers

Mecosta

MS. DAWN FULLER
Big Rapids Dial-A-Ride
1829 N. State Street
Big Rapids, MI 49307

Telephone No.: (231) 796-8675 Fax No.: (231) 796-0797 Email: bigrapidstransit@sbcglobal.net

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St. Clair

MR. JIM WILSON
Blue Water Transportation Commission
2021 Lapeer Avenue
Port Huron, MI 48060

Telephone No.: (810) 987-7381 Fax No.: (810) 987-2431 Email: jwilson@bwbus.com

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Branch

MS. KARA DERRICKSON
Branch Area Transit Authority
306 South Clay Street, P.O. Box 979
Coldwater, MI 49036

Telephone No.: (517) 279-8671 Fax No.: (517) 278-2300 Email: authoritbr@cbpu.com

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Livingston

MS. MARCY HOSKING
Brighton Community Education
7878 Brighton Rd.
Brighton, MI 48116

Telephone No.: (810) 299-3822 Fax No.: (810)220-1910 Email:

Berrien

MS. KIMBERLY O'HAVER
Buchanan Dial-A-Ride
310 Main Street
St. Joseph, Michigan 49085

Telephone No.: (269) 983-8990 Fax No.: (269) 983-4248 Email: tmikim@parrett.net

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Calhoun

MS. JOLENE ENGLISH
Burnham Brook Center
200 W. Michigan Ave.
Battle Creek, MI 49017

Telephone No.: (269) 966-2566 Fax No.: (269) 441-0967 Email: jenglish@region3b.org

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Calhoun

MS. JESSICA RUSSELL
CAA of South Central Michigan
P.O. Box 1026
Battle Creek, MI 49016

Telephone No.: (269) 441-1351 Fax No.: (269) 965-1152 Email: jessicar@caascm.org

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7/3/2008

Transit Agency Address/Phone Numbers

Wexford

MR. VANCE EDWARDS
Cadillac/Wexford Transit Authority
1202 North Mitchell
Cadillac, MI 49601

Telephone No.: (231) 775-9411 Fax No.: (231) 775-9420 Email: cwtadirector@yahoo.com

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Genesee

MS. SANDY PARRA
Campbell Lewellyn Montrose Senior Center Advisory Council
200 Alfred Street
Montrose, MI 48457

Telephone No.: (810) 639-2822 Fax No.: (810) 639-5899 Email: montrosesrctrdir@yahoo.com

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Ingham

MS. SANDRA DRAGGOO
Capital Area Transportation Authority
4615 Tranter Street
Lansing, MI 48910

Telephone No.: (517) 394-1100 Fax No.: (517) 394-3733 Email: dalexander@cata.org

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Genesee

MS. LINDA MOORE
Carmen Ainsworth-Flint Twp.
2071 S. Graham Rd.
Flint, MI 48532

Telephone No.: (810) 732-6290 Fax No.: (810) 732-6305 Email: casr@gfn.org

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Tuscola

MS. LOIS SUTTON
Caro Transit Authority
PO Box 325
Caro, MI 48723

Telephone No.: 989 673-8488 Fax No.: 989-672-1761 Email: judym@hdc-caro.org

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Cass

Cass Co Council on Aging

Telephone No.: Fax No.: Email:

Cass

MS. JULIE HARTMAN
Cass County Transportation Authority
120 North Broadway Street
Cassopolis, MI 49031

Telephone No.: (269) 445-2455 Fax No.: (269) 445-2647 Email: castrans@beanstalk.net

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7/3/2008

Transit Agency Address/Phone Numbers

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7/3/2008

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APPENDIX E
ADDENDUM #3 – QUESTIONS AND ANSWERS

1. **Q: Will the State consider including the Azure Dynamics Hybrid Electric Drive system as an option for this RFP? Or any hybrid vehicles?**

A: MDOT is not considering a hybrid option at this time.

2. **Q: <u>Pg 55, Terms & Conditions, Section 2.243 Liquidated Damages</u> - In the first paragraph, we agree with the intent of this section and the penalty of $100 per day for late or improper completion of work. However, please delete the additional $5000 penalty clause. We believe this amount to be excessive and well beyond the reasonable "loss and damage" an agency could suffer. This appears to be a penalty amount that is found in construction type contracts.**

A: Section 2.243 Liquidated Damages has been replaced with the following language:

D. The Michigan Department of Transportation, Bureau of Passenger Transportation; Authorized Local Units of Government, and Public Transit Agencies and the Contractor hereby agree to the specific standards set forth in this Contract. It is agreed between the Contractor and the Michigan Department of Transportation, Bureau of Passenger Transportation; Authorized Local Units of Government, and Public Transit Agencies that the actual damages to the Michigan Department of Transportation, Bureau of Passenger Transportation; Authorized Local Units of Government, and Public Transit Agencies as a result of Contractor's failure to provide promised services would be difficult or impossible to determine with accuracy. The Michigan Department of Transportation, Bureau of Passenger Transportation; Authorized Local Units of Government, and Public Transit Agencies and the Contractor therefore agree that liquidated damages as set out herein shall be a reasonable approximation of the damages that shall be suffered by the Michigan Department of Transportation, Bureau of Passenger Transportation; Authorized Local Units of Government, and Public Transit Agencies as a result thereof. Accordingly, in the event of such damages, at the written direction of the Michigan Department of Transportation, Bureau of Passenger Transportation; Authorized Local Units of Government, and Public Transit Agencies the indicated amount as liquidated damages, and not as a penalty. Amounts due the Michigan Department of Transportation, Bureau of Passenger Transportation; Authorized Local Units of Government, and Public Transit Agencies as liquidated damages, if not paid by the Contractor within fifteen (15) days of notification of assessment, may be deducted by the Michigan Department of Transportation, Bureau of Passenger Transportation; Authorized Local Units of Government, and Public

Transit Agencies from any money payable to the Contractor pursuant to this Contract. The Michigan Department of Transportation, Bureau of Passenger Transportation; Authorized Local Units of Government, and Public Transit Agencies will notify the Contractor in writing of any claim for liquidated damages pursuant to this paragraph on or before the date the Michigan Department of Transportation, Bureau of Passenger Transportation; Authorized Local Units of Government, and Public Transit Agencies deducts such sums from money payable to the Contractor. No delay by the Michigan Department of Transportation, Bureau of Passenger Transportation; Authorized Local Units of Government, and Public Transit Agencies in assessing or collecting liquidated damages shall be construed as a waiver of such rights.

E. The Contractor shall not be liable for liquidated damages when, in the opinion of the M Michigan Department of Transportation, Bureau of Passenger Transportation; Authorized Local Units of Government, and Public Transit Agencies, incidents or delays result directly from causes beyond the control and without the fault or negligence of the Contractor. Such causes may include, but are not restricted to, acts of God, fires, floods, epidemics, and labor unrest; but in every case the delays must be beyond the control and without the fault or negligence of the Contractor.

F. Liquidated damages will be assessed as follows:

If the contractor does not deliver the vehicle/s, ready for use on or before the scheduled delivery date, the contractor shall pay to the State and/or Local Unit of Government, as fixed and agreed, liquidated damages, for each calendar day between the delivery date specified and the date of final delivery, but not more than 30 calendar days in lieu of all other damages due to such non-delivery, an amount of 1/10th of 1% of the Purchase Order/Departmental Contract Release Form unit cost per vehicle.

If some, but not all, of the vehicle/s described in the Purchase Order/Departmental Contract Release Form are delivered ready for use, by the scheduled delivery date, liquidated damages shall not accrue against the vehicle/s delivered.

If the delay is more than thirty 30 calendar days, then by written notice to the Contractor, the State and/or Local Unit of Government may terminate the right of the contractor to deliver, and may obtain substitute vehicle/s. In this event, the Contractor shall be liable for liquidated damages in the amounts specified above until acceptable substitute vehicle/s are delivered, ready for use, or for 30 days from the scheduled delivery date, whichever occurs first.

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3. **Q: <u>Pg 55, Terms & Conditions, Section 2.243 Unauthorized Removal</u> - Please delete paragraphs 2, 3 and 4 of section 2.243. This also appears to be a penalty clause more typical of construction contracts. We have never seen a clause of this type in any other state contracts for similar products.**

A: This language has been deleted and replaced by the revised language in the answer to question # 2.

4. **Q: <u>Page 1, Specifications, Section I, Weight Calculation</u> - In the 4th paragraph, please delete the statement about not exceeding 95% of front and rear spring capacity for the following reasons: 1.) Ford QVM does not require this, 2.) Ford and Chevy have safety factors already built into their designs. Adding a 95% limitation is adding a safety factor on top of a safety factor. 3.) Michigan is the only state we are aware of that has this requirement.**

   A: This specification will <u>not</u> be deleted and will remain as specified.

5. **Q: <u>Page 1, Specifications, Overall Length of Single Wheelchair Buses</u> - In the 4th paragraph, it is requested that single wheelchair buses not exceed 21' 11" in length (measured bumper to bumper excluding the energy absorbing portion of the bumpers) in order to meet ADA requirements. This would apply to floor plans B and D. But as you can see from the attached floor plans, it is not possible to meet this requirement. Part of the reason is that the front end of the Ford chassis grew almost 5" in 2008. Drawings are attached of the 2007 and 2008 Ford chassis for reference. The overall length is also driven by the five (5) rows of seats on the street side with 27" hip-to-knee spacing. To keep these floor plans under the ADA requirement, a row of seats will need to be removed, or the hip-to-knee spacing would have to be decreased considerably, coupled with other changes such as deleting the top grab handles from the foldaway seats so they don't hit the seats in front of them when folding, and possibly decreasing the 54" L-track spacing.**

   A: In Appendix B, Small Bus Specifications, page 48, delete floor plan D in the specifications. Floor plan B will remain as specified. Also, on the Cost Model sheet, remove "D" under "passenger seats with vinyl seat covers." Add the quantity of 10 to "B" bringing the total to 38. Also, on the Cost Model sheet, remove "I" under "passenger seat with fabric seat covers." Add the quantity of six (6) to "G" bringing the total to 21. These items have been crossed on the cost model sheet and a revised one is attached to show the

deletions. Please complete this revised version of the cost model and include in your bid submittal.

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6. **Q: <u>Page 4, Section B.1.f., Fender Splash Guards</u> - In lieu of rubber fender splash guards, please accept our standard mud flaps on the front and rear wheel openings. In addition, our rear wheel openings are enclosed in a custom formed, highly-flexible and durable plastic material called TPO as seen in the attached photo. This material is scratch and dent resistant, even in cold temperatures.**

   A: This specification will remain as specified.

7. **Q: <u>Page 8 and 26, Section E.1.and I., Door Latches</u> - In lieu of South Co brand latches, please accept our standard latch. We use a simple and reliable, quarter-turn thumb latch device, as seen in the attached literature, for all our compartment doors.**

   A: This specification will remain as specified.

8. **Q: <u>Page 8, Section E. 2., Interior Panels</u> - Please also accept our standard, padded light gray vinyl as an acceptable interior material for the modesty panels, door headers (for head protection), and in the driver's cab area for sound absorption. This material is durable, easily cleanable, and repairable if damaged. Sample available upon request.**

   A: This specification will remain as specified.

9. **Q: <u>Page 9, Section F. 4.,</u> Wheelchair Area Flooring - Please accept <u>ribbed</u> rubber flooring in the wheelchair area for added protection against slipping.**

   A: This specification will remain as specified.

10. **Q: <u>Page 15, Section P.4.a.7., Seat Material -</u> Please be advised that CMI Nanocide Dimensions is a vinyl fabric, and does not meet Federal Register dated October 20, 1993. This product should be deleted from the bid spec.**

    A: The reference to CMI Nanocide Dimensions is deleted from the specification. All other sources remain as specified.

11. **Q: <u>Page 16, Section P.5.a., Retractors</u> - Please delete the word "emergency" from the description of locking retractors. Emergency locking retractors are not commonly used in bus seats, except for the driver's position. They cannot be used to secure child seats.**

A: This specification will not be deleted and will remain as specified.

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12. Q: Page 17, Section Q.7., Entrance Step Guardrail - The first sentence of the section asks for a horizontal guardrail on the right side of the entrance steps. The previous paragraph asks for an entry handrail running parallel to the steps on the right side of the entrance steps. Please accept that this parallel handrail on the right side will also serve as a guardrail.

A: This specification will remain as specified**.**

13. Q: Page 17, Section Q.7, Wheelchair Modesty Panel - In addition to the description provided for the modesty panel behind the chair lift, please also accept our standard design that extends the padded-vinyl panel full height.

A: This specification will remain as specified**.**

14. **Q: <u>Page 20, Section W, Paint</u> - When optional painting is called for, such as painted stripes or full-body color other than white, please accept that the painting is done at a specialized supplier at an off-site location, and as such the body must be complete with all body mounted accessories (rubrails, fenders, lights, etc) in place. Care will be taken to professional mask-off any components not to be painted.**

    A: This specification will remain as specified

15. **Q: <u>Page 25, Section I, Battery</u> - Delco is the brand name of batteries used by GM. Please also accept the standard Ford Motorcraft brand batteries rated at a minimum of 650 CCA each.**

    A: Alternate batteries will be accepted if they meet or exceed the specifications.

16. **Q: <u>Page 26, Section K, Alternator</u> - Ford now offers a 195 amp OEM alternator on its gas engine chassis. Please accept this alternator's rating in lieu of 200 amps.**

    A: A Ford extra, heavy-duty 195 amp alternator is acceptable providing it meets or exceeds the bus's electrical specifications.

17. **Q: <u>Page 27, Section P., Hazard Flasher</u> - Please accept the Ford OEM hazard flasher in its standard location. Ford has upgraded the hazard flasher in 2009 to a transistorized assembly and is now a part of its "Smart Box" module.**

    A: This specification will remain as specified**.**

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18. **Q: Page 31, Section B.1., Lift Circuit Breaker - Because the batteries are mounted in a slide out tray, please accept that the lift circuit breaker is also mounted in the slide out tray (in lieu of under the hood) since it has to be close to the batteries.**

    A: This specification will remain as specified.

19. **Q: Page 31, Section B.4, Fuses - In second sentence, please delete "…when expressly required by the component manufacturer". Several manufacturers use blade type fuses as standard. See attached information on the type of system we use.**

    A: This specification will not be deleted and will remain as specified.

20. **Q: Page 31, Section B.7, Quiet Switch - Please accept an alternative location for the "Quiet Switch", located in the base of the driver's seat, out of the way so it cannot be accidentally activated. This is a heavy-duty rotary style switch with a heavy electrical cable running to it, and doesn't fit in the driver's control panel very well.**

    A: This specification will remain as specified.

21. **Q: Page 24, Section A.1.5., AC Fittings - In lieu of EZ Clip or Quick Clik, please accept our standard ATCO Air-O-Crimp system of hoses and fittings for the AC system, as described in the attached literature. This is the system recommended by Pro-Air, our AC installer.**

    A: This specification will remain as specified.

22. **Q: Page 35, Section C., Cold Climate Package - In the first sentence, please define "Cold Climate Package".**

    A: As specified – block heater with cord and covered receptacle. Contact chassis manufacturer for further information.

23. **Q: Page 37, Section H, Engine Shutdown System - To the best of our knowledge, there is no commercially available engine shutdown system for the Ford gasoline engine.**

    A: This specification will remain as specified.

24. **Q: Page 41, Section A.6, Manual - Please define what is a "drivability and emissions manual".**

    A: The Drivability and Emissions manual could also be referred to as a diagnostic manual. These manuals show vehicle diagnostic procedures for a diagnostic trouble code (DTC) through diagnostic charts and functional checks. Many of the chassis manufacturers publish this manual.

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25. **Q: <u>Page 43, Section C, Air Conditioning Certification</u> - In lieu of an independent agency, please allow the AC testing to be performed by the AC manufacturer in their facility designed for this type of testing.**

    A: This specification will remain as specified.

26. **Q: <u>Page 43, Section D, Heating Certification</u> - Please clarify whether both pilot buses (a gas model and a diesel model) will need to be tested, and that all vendors will have to perform the same testing. The testing is elaborate and will need to be conducted in a very specialized facility at considerable expense.**

    A: Only the diesel bus is required to be tested. All vendors are required to perform this test.

27. **Q: 1) Section VI.A OPTION A ONLY – AIR CONDITIONING SYSTEM: Sub-section 3. – "*The condenser coil shall be copper tube..*" Carrier's new Microchannel condenser coil consists of ALUMINUM tubing which is superior in heat transfer (more primary surface area), and corrosion resistance (due to the removal of the galvanic couple and the inclusion of the zinc plasma coating) to the specified copper tubing. CTD will require an exception to this wording and requests the inclusion of: "copper *or aluminum* tube…" into the specification.**

    A: Aluminum is acceptable. The sentence shall read: "The condenser coil shall be a copper or aluminum tube expanded into aluminum fins and vinyl-coated."

28. **Q: <u>Clarification requests are as follows: Sub-section 2.- Compressor ; Sub-section 3.- Condenser, and Sub-section 4.a.- Evaporators</u>: Please change the listed suggested source company name from A.C. Industries to Carrier Transicold. A.C. Industries was purchased by Carrier Corporation in 1991.**

    A: All references to A.C. Industries shall be changed to Carrier Transicold.

29. **Q: <u>OPTION B- Sub-section 2.-</u> If we provide our new model K- 410 roof mounted condenser; which is only 5.71" high vs. our old KR- 3 model which is 10.58" high, do we still need to bid a separate branch guard?**

    A: Yes, a separate branch guard is required.

30. **Q: As most of the State of Michigan representatives know that have worked with us on previous contracts, we have complied with the requirement to establish a:**

    "factory dealer with repair facilities and personnel in Michigan, or may be a factory dealer…" [See page 37 Section 2.111 Inspection of Work Performed, page 1 Para. I Purpose of Specifications and various other locations in RFP].

    However, in light of recent federal law we respectfully request that Michigan reconsider and delete any requirement from the terms and conditions and evaluation process in this solicitation for an in-state dealer. Provided for your convenience we submit an excerpt from the new SAFETEA legislation that

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President Bush recently signed into law. The requirement for an in-state dealer is addressed in Section 5325. Contract requirements and reads in part:

"(h) GRANT PROHIBITION.—A grant awarded under this chapter or Federal Public Transportation Act of 2005 may not be used to support a procurement that uses an exclusionary or discriminatory specification.

(i) BUS DEALER REQUIREMENTS.—No State law requiring buses to be purchased through in-State dealers shall apply to vehicles purchased with a grant under this chapter."

A: Delete the following sentences from the RFP document, Section 2.111:
"Final inspection will be made at a Michigan location. The successful contract shall have a factory dealer with repair facilities and personnel in Michigan, or may be a factory dealer with repair facilities and personnel in Michigan capable of handling final inspections, corrections, and warranty follow-up."

In Appendix B, Small Bus Specifications, delete the following sentences from page 1, Section I, Purpose of Specifications, paragraph 3:

"The bidder shall have a factory dealer with repair facilities and personnel in Michigan or the bidder may be a factory dealer with repair facilities (including a bus lift) and personnel in Michigan. Any in-state facility shall be capable of handling final inspection and corrections required by the State prior to acceptance of the buses after a contract is awarded."

31. **Q: Liquidated Damages: We request that liquidated damages be deleted from this contract. Liquidated damages increase the risk and thus can impact the final price of the buses to the State of Michigan. The Federal Transit Administration discourages the use of liquidated damages unless a quantifiable loss can be calculated. We have not seen the extent of damages specified in these procurement documents before where this a large lump sum and an additional daily charge. Please delete the requirement for liquidated damages. This section is found on page 55 Section 2.243 and referenced elsewhere in the procurement documents.**

    A: Please refer to the answer to Question #2.

32. **Q: 3.031 Reciprocal Preference [page 65] [and elsewhere in the procurement documents]: Please note that the Federal Transit Administration prohibits geographic preference for the acquisition of buses when federal funds are involved. Reciprocal preference should not be a factor in our case since our corporate offices are located in the State of New York and our Midwest office is located in Ohio and preference is not granted or practiced in the States of New York or Ohio. Please note that the State of Indiana where some of our competitors and their bus manufacturers may be domiciled do encourage geographic preference. Go to this web link to review the Buy Indiana Initiative http://www.in.gov/idoa/2736.htm.**

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A: Per the FTA, in-state or local geographical preferences in the evaluation of bids or proposals shall be excluded except in those cases where applicable Federal statutes expressly mandate or encourage geographic preference. Therefore, in the RFP document Section 3.031 Reciprocal Preference is deleted.

33. **Q: 3.032 Qualified Disabled Veteran Preference page 65 [and elsewhere in the procurement documents]: This provision appears to be a State of Michigan and not a federal provision. Because the FTA in most cases will provide up to 80% of the funding for bus purchases, we request that this provision be deleted from the procurement. While we appreciate all that our veterans have done for us and this country's freedom, we do not believe that allowing a bidding preference meets the spirit of: a maintaining a level playing field in free and open competition, FTA regulations against bidding preferences, nor does it ensure the best price to Michigan customers.**

    A: This is not a State or local preference. This preference applies to a bidder's status and is not a geographical preference. This section will not be deleted.

34. **Q: I. PURPOSE OF SPECIFICATIONS [page 1]: 5-years/150,000 miles. The Phoenix model bus we are proposing was tested at Altoona using the 7-years/200,000 miles criteria in November 2007. The FTA has ruled that a bus model that has been tested at a higher mileage and time interval is acceptable and will not impact the funding replacement cycle. Provided below are excerpts from and two FTA web links:**
    http://www.fta.dot.gov/funding/thirdpartyprocurement/faq/grants_financing_6087.html
    http://www.fta.dot.gov/funding/grants/grants_financing_7706.html

    a. Under Subpart B 665.11 Testing Requirements (5)(f) states that ....."the use of a bus model in a service application higher than it has been tested for may make the bus subject to the bus testing requirements".

    Does this mean that even though a bus fits into the testing category of 4 year/ 100,000 mile by definition, If MDOT requires a minimum service life of 5 years/150,000 miles.....must the bus be tested in that category?
    Bus manufacturers self-select which service life category they test their buses in. However, FTA funds may not be used to procure a bus in an application requiring a higher service life category than the highest service life category in which that bus has been tested. For example, if a bus has been tested in the 7-year category, it may be sold using FTA funds in the 7, 5, and 4-year categories, but it may not be sold using FTA funds in the 10 or 12-year service life categories."
    b. Who determines the useful life standards for transit vehicles, and where can this information be accessed? For subrecipients of Section 5310 and 5311 funds, the useful life of vehicles is determined by the State Agency. This information should be contained in each State's Management Plan.
    For direct recipients of Section 5309 and 5307 funds, FTA determines the useful life of vehicles.

FTA minimum normal service lives for buses and vans are:
Large, heavy-duty transit buses (approximately 35'-40', and articulated buses): at least 12 years of service or an accumulation of at least 500,000 miles.
Medium-size, heavy-duty transit buses (approximately 30'): 10 years or 350,000 miles.
Medium-size, medium-duty transit buses (approximately 30'): 7 years or 200,000 miles.
Medium-size, light-duty transit buses (approximately 25'-35'): 5 years or 150,000 miles.
Other light-duty vehicles, such as small buses and regular and specialized vans: 4 years or 100,000 miles."

A: A 7-year/200,000 mile bus is acceptable and can be submitted for bid.

35. **Q: I. PURPOSE OF SPECIFICATIONS [page 1] second paragraph: Please change the requirement from requiring a "quick title" to providing a "manufacturer's statement of origin". A quick title may only be issued by a dealer in the State of Michigan. FTA regulations prohibit the requirement of specifying an in state dealer. Please see references above in earlier request.**

    A: This specification will remain as specified. Quick (instant) titles can also be issued at designated State of Michigan Secretary of State branch offices. Please refer to the website link below:

    http://www.michigan.gov/sos/0,1607,7-127-1585-76317--,00.html

36. **Q: Paragraph b, Page 3 & M. Undercoating/Rust proofing page 12 [corrosion protection]: Our standard body construction includes undercoating that meets Ford QVM standards including the exposed sub-floor and body structure. All exposed and concealed structural steel body members are galvanized steel and body skins utilize galvanealed steel. We request that our standard construction be accepted as the corrosion resistant coating required in this paragraph.**

    A: This specification will remain as specified. Corrosion problems are an issue with Michigan transit agencies.

37. **Q: Paragraph c, page 3, stainless steel door frame: We request approval of our standard door frame which is constructed of galvanized steel, primed and painted white.**

    A: This specification will remain as specified. Only stainless steel is accepted due to past corrosion problems.

38. **Q: Paragraph f, page 4: Our standard bus comes with rubber fender splash guards on rear wheel openings. Ford does not offer standard rubber fender splash guards on the front wheel openings with their cutaway chassis. We do install front mud flaps that serve as splash guards against tire spray. We request that the requirement for front rubber fender splash guards that cover the wheel well perimeter be deleted or clarified that mud flaps are acceptable.**

    A: This specification will remain as specified.

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39. **Q: C. Passenger Door, Para. 1, page 7: We request approval to provide our standard door frame which is constructed of galvanized steel, primed and painted white, in lieu of stainless steel.**

    A: This specification will remain as specified. Only stainless steel is accepted due to past corrosion problems.

40. **Q: C. Passenger Door, Para. 2, page 7: In lieu of a "hinged access door we request approval to provide our standard closure panel at the entrance door header for accessing the door motor and linkage. The panel can be removed totally for ease of access and is secured in place by automotive grade fasteners that can be removed without hand tools.**

    A: This specification will remain as specified**.**

41. **Q: C. Passenger Door, Para. 2, page 7: We request in addition to Excell and Vapor that the Coach & Equipment [C&E] and A&M electric door operators be accepted as equal. The C&E is our own design. The A&M door operator can be viewed at this web link http://www.anmsystems.com/electric.htm.**

    A: Yes, A&M Door Systems are acceptable. The Coach & Equipment door is not acceptable.

42. **Q: C. Passenger Door, Para. 3, page 7: Please accept our standard front door toggle switch that meets these specifications in every regard except that it is not a different color. It is clearly identified and labeled.**

    A: This specification will remain as specified.

43. **Q: D. Passenger Step well, page 7: We request approval to provide our standard galvanized steel step well in lieu of stainless steel.**

    A: This specification will remain as specified. Only stainless steel is accepted due to past corrosion problems.

44. **Q: E. Interior, Para. 1, Page 8: In lieu of South CO Model #M1-61-1 latch, we request approval to provide our standard latch to hold the door positively closed. There are two [2] metal, knurled dial handles that can be turned/tensioned to tighten down the door. See photo below of compartment with two knobs.**

    A: This specification will remain as specified**.** The State has received complaints from transit agencies over the use of knurled dial handles as they had problems closing the door.

45. **Q: E. Interior, Para. 2, Page 8: We request approval to offer our standard "white" FRP interior bus body walls skins, in lieu of the light grey color requirement.**

    A: This specification will remain as specified.

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46. **Q: F. Flooring, Para. 4, page 9: We request approval of our standard flooring design where the RCA rubber floor meets the side wall at floor level in lieu of the design used by our competitor where the flooring extends up the sidewall to the seat rail. Our flooring is properly sealed and trimmed to make a water tight transition.**

    A: This specification will remain as specified.

47. **Q: F. Flooring, Para. 8, page 9: Due to changes on the Ford Chassis for model year 2009 we will "NOT" be able to offer a fuel sender access panel in the floor. Ford has moved the gas tank and fuel sender directly between the frame pucks for mounting cross members. We would be in violation of Ford QVM if we were to change the cross member mounting points. Please delete this requirement.**

    A: The State verified this change with Ford Motor Company. The access panel to the fuel tank sending unit can be removed; however, bidders are still required to provide an access panel to the reservoir fill/check areas.

48. **Q: G. Emergency Exits, Para. 2, page 9 & 10: We request approval of our standard galvanized steel door frame in lieu of stainless steel. Our emergency door design has evolved over the last several years to include new hinges, seals and construction to ensure proper corrosion protection.**

    A: This specification will remain as specified. Only stainless steel is accepted due to past corrosion problems.

49. **Q: K. Mud Flaps, page 11: We request approval to provide our standard front and rear mud flaps that do not include the inverted "T" bracket. We also request approval of our standard design which includes rear body but not front chassis wheel well rubber fender splash guards [see earlier request regarding splash aprons].**

    A: This specification will remain as specified.

50. **Q: N. Paragraph 1. Interior Mirror, page 12: Please accept our standard interior "convex mirror" which exceeds the 4" x 12" minimum requirements in lieu of the specified "flat mirror".**

    A: This specification will remain as specified.

51. **Q: 1. Driver's Seat, page 13: Please confirm that the Ford OEM driver's seat is also acceptable.**

    A: Yes, a Ford OEM driver's seat is acceptable if it meets or exceeds the RFP specifications.

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52. **Q: 4. All Seats, page 14: To minimize misinterpretation please clarify what Level [Ex. 1, 2, 3, 4, 5, 6] fabric, cloth and vinyl, Michigan requires. It is our interpretation of these specifications that Level 4 Docket 90 fabric for the vinyl seats is required and that the seat bottom and back must be fully encapsulated. However, we have two concerns with this specification. We are told by our seat supplier that the CMI Dimensions cloth fabric specified does not meet Docket 90 as your specification requires. Synergy Level 6 cloth does meet Docket 90. Also, we wish to clarify that it is customary for the seat manufacturer to use its standard encapsulation backing fabric underneath the seat cushion bottom to completely enclose the cushion instead of using the same material all the away around the seat cushion. We request approval to provide standard Docket 90 seat backing material for encapsulation. Please confirm or clarify.**

    A: The reference to CMI Nanocide Dimensions is deleted. Yes, Synergy Level 6 is acceptable if it meets or exceeds specifications. Yes, the State will accept the manufacturer's standard encapsulation backing fabric underneath the seat cushion if it meets or exceeds Docket 90.

53. **Q: 8. Exterior Lighting, Para. 2, page 18: Please accept our C&E standard license plate light in lieu of the specified Peterson Model M143C-MV with Peterson Model 150-40 bracket.**

    A: This specification will remain as specified.

54. **Q: 8. Exterior Lights, Para. 3 Marker Lights, page 18: Please accept our standard armor protected LED oblong marker lights in lieu of the 2" diameter specified lights. Please see photo below.**

    A: This specification will remain as specified.

55. **Q: 8. Exterior Lighting, License Plate Mounting Para. 7, page 18: Please accept our standard license plate mounting. See photo above in request 20.**

    A: This specification will remain as specified.

56. **Q: U. HVAC, Rear Heater Para.3, page 19: Please accept our standard floor mounting arrangement of rear heater in lieu of requiring rubber or nylon insulators between the mounting base and the bus floor. See photo below.**

    A: This specification will remain as specified.

57. **Q: U. HVAC, Rear Heater Hose Paras.4 & 7, page 19 & 20: In lieu of EPDM material hose, please accept our automotive grade rubber heater hose that does not require insulation and has sufficiently inherent insulating properties to not require an additional level of insulation as required in paragraph 7.**

    A: This specification will remain as specified.

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58. **Q: U. HVAC, Rear Heater Shut Off Valves Para.5, page 19: Please accept our standard shut off valve location. Valves are accessed from underneath the vehicle inside the frame rail about two feet behind the driver's seat mounting location.**

    A: This specification will remain as specified.

59. **Q: V. Windows, Para. 1, page 20: Please accept our standard windows which meet all applicable FMVSS requirements for automotive safety glass. We are not clear what is meant by "double density". Our windows are upper "T" sliders and are a single pane thick. Please also accept our driver's right side window which is single piece automotive safety glass meeting specifications but is not provided by Hehr or Kinro.**

    A: This specification will remain as specified. Please contact the glass manufacturer as referenced.

60. **Q: W. Paint: Please accept our white bus paint process as meeting the requirements of this entire section. We believe our process exceeds these requirements. Our paint process is described in a narrative enclosed with these requests.**

    A: This is acceptable if it meets or exceeds specifications.

61. **Q: X. Insulation, Para.1: Our passenger and driver floor areas are not insulated. Our entire bus has an R7 insulation rating. Our floor structure consists of a metal belly pan, overlaid with ¾" plywood and then the floor covering material. Please approve.**

    A: This specification will remain as specified.

62. **Q: Y. Type I Lift, Door Frame Para.3, page 22: We request approval of our standard galvanized steel door frame in lieu of stainless steel.**

    A: This specification will remain as specified. Only stainless steel is accepted due to past corrosion problems.

63. **Q: I. Battery, page 24 & 25: We request approval to provide:**

    a. **Two [2] Ford chassis OEM fully charged batteries in lieu of the specified Delco batteries, and**
    b. **Our gasoline powered bus one battery is located under the hood in the engine compartment and the other in the skirt mounted battery box in a stainless steel roll out tray, in lieu of both batteries in the skirt mounted battery box. For the diesel engine bus both batteries are located in the skirt mounted battery box with stainless steel slide out tray.**
    c. **The inside of our battery box is painted galvanized steel in lieu of being covered with an insulating material.**
    d. **Out standard D Ring pull style battery compartment door latches in lieu of the specified SouthCo Model #M1-61-1. See photo below.**

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A: a. Please refer to the answer for Question #15.
b. This specification will remain as specified. All batteries are to be located in the stainless steel slide-out tray.
c. This specification will remain as specified. Only stainless steel is accepted.
d. The specification for latches will remain as specified.

64. Q: J. Battery Cable and Grounds, page 25: We request approval of our standard cabling and grounding which meets the intent of these specifications and as provided in previous contracts. A description of our electrical system is enclosed with these requests. We are able to provide detailed wiring diagrams upon request.

A: This is acceptable if it meets or exceeds specifications.

65. Q: K. Alternator, Page 26 & 27: We request approval to provide a 195 Amp alternator that will meet the power requirements of this bus as specified. Effective with model year 2009, Ford introduced a high capacity 195 amp alternator compatible with the 6.8L gasoline engine that is warranted by Ford. Requiring a 200 Amp alternator would require bidders to use an aftermarket alternator. Reducing the requirements for the alternator by 5 amps gives them the full coverage of the ford bumper to bumper warranty.

A: Please refer to the answer to Question #16.

66. Q: L Fast Idle, Page 27: We propose to offer the InterMotive AFIS listed in the specifications. Please note that this system does not include a manual switch as specified but is instead fully automatic.

A: This is acceptable if it meets or exceeds specifications.

67. Q: O. Hazard Flasher, page 27: We request approval to provide the Ford chassis standard location on the column and Ford OEM flasher in lieu of the specified dash location and suggested sources.

A: Please refer to the answer to Question #17.

68. Q. Suspension, MorRyde Para.2, page 28: Please delete the requirement for an aftermarket add on rear suspension system and accept the Ford OEM suspension system. We are experiencing an inordinate number of warranty claims when using any of the aftermarket add-on rear suspension systems that offer little if any advantage in ride quality. To assist with load leveling of the vehicle we are able to offer in lieu of an after market rear suspension system, our C&E spacer block that is added to the lift side of the buses rear suspension.

A: This specification will remain as specified.

69. Q: S. Wheels, page 28: Please accept Ford OEM standard valve stems in lieu of the stainless or brass specified.

A: This specification will remain as specified.

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70. **Q: W. Radiator and Cooling System, page 28: Please accept the standard cooling system that comes on the Ford OEM chassis which is a belt driven fan, in lieu of a clutch-type fan.**

    A: This specification will remain as specified.

71. **Q: B. Electrical, Lift Protection Para. 1, page 31: Please accept our fuse protected lift circuit in lieu of requiring a manual reset circuit breaker. This fuse is located in the battery box and not under the hood.**

    A: This specification will remain as specified.

72. **Q: B. Electrical, Panels Para.4, page 31: We do not use the RC Tronics system. Our electrical engineers have designed our own electrical system. Please see an explanation of our electrical system attached.**

    A: Yes, if it has a lifetime warranty and meets or exceeds specifications, then it is acceptable. The RC Tronics system has a lifetime warranty.

73. **Q: B. Electrical, Panels Para.7, page 31: We do not use a constant solenoid or a master switch in our electrical system. We request approval of our electrical system. See wiring diagrams attached. Please approve.**

    A: This specification will remain as specified.

74. **Q: Option F. Engine Shutdown System, page 37: We request that this requirement be deleted. The Murphy system is an aftermarket system not supported by the chassis OEM. The diesel engine has its own built in protection system that is standard on the Ford OEM diesel chassis.**

    A: This specification will remain as specified.

75. **Q: A. Vehicle Information Furnished, Para. 7 DVD, page 41: We request that this requirement be deleted.**

    A: This specification will remain as specified.

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76. **Q: B Manufacturer Quality Control: In this section of the specifications we appreciate that the ISO 9001:2000 Certification is cited as an example of a quality control program but is not a requirement. Our manufacturer is in the process of ISO certification. We estimate that it will take us approximately 9 - 10 months to receive our certification. Until then we will continue to use the excellent quality program that the State of Michigan has seen first hand in our most recent contract. Also, the fact that we are actively in the certification process and that we have such a high QVM rating from Ford indicates our commitment to quality. As you know ISO alone does not involve any judgment of a company's product quality -- only that the company has certain processes in place and are trying to follow their own processes, even if those processes are ineffective in assuring product quality. Many companies not certified by ISO build a much higher quality product, and just not have taken the time and gone to the expense of ISO certification. We shall submit our quality control plan with our bid.**
A: The State has acknowledged your comment.

77. **Q: This letter is being written to request an approved equal status for the A&M door actuator/control and the A&M door leafs. This change is being requested by ElDorado National as a result of Vapor Industries 2005 decision to eliminate the model that they had been providing to ElDorado National. This change was allowed for both of the following prior contracts and the product has performed well: Medium Duty Bus Contract No. 071B4200165 and Small Bus Contract No. 071B5200049.**

A: Please refer to the answer to Question #41.

78. **Q: Pages 14 & 15 of the specification: The Specifications call for the seat foam to be encapsulated. Does the State require the bottom of the seat cushion to match the seat fabric or can a more cost effective material be utilized? If matching is required, this is an increased cost dependent upon which fabric/vinyl chosen.**

A: Please refer to the answer to Question #52**.**

79. **Q: Pages 14 & 15 of the specification: This is just a point of clarification from Freedman regarding Section 4(a)(7) – CMI Nanocide Dimensions is a vinyl not fabric and is not Docket 90 material. This should be removed as a cloth suggested source according to Freedman Seating.**

A: Please refer to the answer to Question #10**.**

80. **Q: Pages 14 & 15 of the specification: Is Synergy an acceptable D-90 fabric for this procurement? Supporting information attached.**

A: Please refer to the answer to Question #52**.**

81. **Q: Page 17 of the specification: Does the State require LED interior courtesy lights?**

A: Yes, LED interior courtesy lights are required.

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82. Q: This is a request for an approved equal status for the new Eldorado National battery box latches: Eldorado is continually making product improvements. Such is the case with our new Battery Box Latches. Part number is E3-57-52. Our new latches are still a SouthCo product as stated in the specification, however the new latches provide a superior functionality and longer life expectancy than the M1-61-1 due to the material used (Stainless Steel) and its corrosion resistant properties. We would like to request that the State specification include the new and improved latches we are now using as standard equipment on our buses as an approved equal.

A: This specification will remain as specified.

83. Q: Section VI.A OPTION A ONLY – AIR CONDITIONING SYSTEM:

a. Q: Sub-section 3: "The condenser coil shall be copper tube" Carrier's new Microchannel condenser coil consists of ALUMINUM tubing which is superior in heat transfer (more primary surface area), and corrosion resistance (due to removal of the galvanic couple and the inclusion of the zinc plasma coating) to the specified copper tubing. We will require an exception to this wording and request the inclusion of: "copper <u>or aluminum</u> tube…" into the specification. (supporting documentation attached)

A: Please refer to the answer to Question #27.

b. Q: Sub-section 2. – Compressor; Sub-section 3. – Condenser, and Sub-section 4.a. – Evaporators: change the listed suggested source company name from A.C. Industries to Carrier Transicold. A.C. Industries was purchased by Carrier Corporation in 1991.

A: Please refer to the answer to Question #28.

c. Q: OPTION B – Sub-section 2. – if we provide our new model K-410 roof mounted condenser; which is only 5.71" high vs the old KR-3 model which is 10.58" high, do we still need to bid a separate branch guard?

A: Please refer to the answer to Question #29.

d. Q: Section VII. C. Air Conditioning Certification: We are requesting that the State revise the requirement for an INDEPENDENT lab test for the heating/cooling in favor of one done at ENC or Carrier. This would provide a cost savings since an independent test costs approximately $5,000 and would require contracting, scheduling, etc with an outside firm which might hold up pilot completion/sign off.

A: This specification will remain as specified.

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84. **Q: This is a request for clarification on Article 1.0708 Security: The driver security background check has not been a requirement in the past for the delivery of buses and represents a significant expense to the contractor. As the drivers are not entering government buildings/facilities, but simply delivering the vehicle(s), we are asking that the security background check requirements be waived.**

    A: Article 1.0708 Security has been deleted from the RFP document.

85. **Q: Page 15, Section 1.062 Price Term: Will you consider an escalation clause on the body in addition to the changes in the chassis equipment? Prices have been extremely volatile recently and almost impossible to project. We ask that you consider an escalation clause based on the PPI that would allow a price adjustment after a period of time. Proposed language is attached for your consideration.**

    A: This clause will remain as stated.

86. **Q: Page 41, Section 2.125 Equipment Warranty: The last paragraph notes that warranty work must be performed at a mutually agreed upon location. Please acknowledge that warranty work on the chassis has to be done at the chassis manufacturer's service center.**

    A: This is acceptable to the State.

87. **Q: Page 1, Section I. Purpose: Will you consider allowing buses to exceed 95% of the spring capacity as long as the bus will not exceed the GAWR and GVWR of the chassis? Some of the seating plans will exceed the 95% of the spring capacity if all of the options were selected, however, the bus weights will not exceed either the GAWR or the GVWR limitations.**

    A: This specification will remain as specified.

88. **Q: Page 1, Section I. Purpose: As chassis front ends have increased in length, seating plans B and D will exceed 21' 11", excluding the energy absorbing portion of the bumper. Will you accept these seat plans on longer buses, as long as two wheelchair securement spaces are provided? Sample plans are attached.**

    A: Please refer to the answer to Question #5.

89. **Q: Page 3, Section B. Body Structure and Exterior Panels, sub-sections b, c, d, f, and h.:**
    a. **We use both galvanized and aluminized steel in our structure. Is this acceptable?**

       A: This is acceptable if it meets or exceeds the specifications.

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b. **We request approval to coat only the welded areas of the structure with a corrosion resistant coating.**

   A: This specification will remain as specified.

c. **Box tubing used in our floor structure is either galvanized or aluminized on the interior. We request that this treatment be accepted in lieu of the coating requirements in Section II. M.**

   A: This specification will remain as specified.

d. **Will you accept our standard steel skin that is .020 (25-gauge) steel, two sides galvanized, in lieu of 20-gauge galvanized steel? The use of 20-gauge material will add unnecessary weight to the bus.**

   A: This specification will remain as specified. There have been issues with warping/bowing in the siding in the past.

e. **We use coated screws for fastener retention in panels and screws and battens on ceiling panels. Approval is requested.**

   A: This specification will remain as specified.

f. **We use self-threading screws to retain the rubrail and No. 8 plated, self-threading bolts for the splash guards. Is this acceptable?**

   A: Yes these are acceptable if it meets or exceeds the specifications.

g. **We request approval for a 3/16", +/- 1/16", frame clearance. This installation is acceptable to our window supplier.**

   A: This specification will remain as specified.

90. **Q: Page 7, Section C. Passenger Door, 2.: We request approval to provide a door system supplied by A&M. The system meets all specification requirements.**

    A: Please refer to the answer to question #41.

91. **Q: Page 9, Section Flooring, 4.: We haven't been able to develop a method of running the flooring up the rear wall that will look finished and seal properly in the corners. Therefore, we suggest stopping the flooring at the rear wall and using caulk to seal the area where the flooring meets the rear wall. An ABS trim strip would be used to finish the area and prevent water from reaching this area.**

    A: This specification will remain as specified.

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92. **Q: Page 10. Section G. Emergency Exits, 2.: We request approval to provide a gas prop in lieu of a sliding door stop to maintain the door in the open position. Is this acceptable?**

    A: This specification will remain as specified.

93. **Q: Page 10. Section G. Emergency Exits, 2.: We use a purchased door that has an FRP skin on both side of the door. Please approve.**

    A: This is acceptable if it meets or exceeds the specifications.

94. **Q: Page 12. M. Undercoating/Rustproofing 2.: All box tubing will be either aluminized or galvanized steel on the interior and exterior. We propose this method of rustproofing in lieu of an alternate corrosion resistant material. Approval is requested.**

    A: This specification will remain as specified.

95. **Q: Page 13. Section P. Driver's Seat, 1a: The driver's seat will be mounted on the chassis OEM seat base. We cannot modify the base, so it will provide the adjustments as supplied by the chassis manufacturer. Please acknowledge.**

    A: This is acceptable if it meets or exceeds the specifications.

96. **Q: Page 15. Section 4. All Seats, (7): The suggested CMI Nanocide Dimensions is a vinyl that does not meet Docket 90. We propose to use LaFrance Synergy fabric which can be seen on the Freedman Seating Co. web site.**

    A: Please refer to the answer to question #10.

97. **Q: Page 15. Section 4. C. Seats General, (2): Is the integrated child restraint to have two child restraints, or a single CRS and a companion seat?**

    A: The integrated child restraint has a single child restraint with a companion seat.

98. **Q: Page 16, Section Q. Handrails, Stanchions, 1.: We propose to use fittings and brackets constructed of stainless steel rather than yellow coated steel. Please approve.**

    A: This specification will remain as specified.

99. **Q: Page 18, Section S. Exterior Lighting: Please delete the requirement for voltage regulated lamps as this feature is only available from one of the suggested sources listed.**

    A: This specification will remain as specified.

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100. Q: Page 22. Section Lift, 6.: Is it your intent that manufacturer's are to provide a lift padding kit?

A: The State's intention is for the vendor to pad sharp corners and edges. If padding is needed, please do not cover the lift counter.

101. Q: Page 23, Section Lift, g.: A lift manufacturer has asked for clarification of the requirement for controls on a flexible, cut resistant cable. They offer a shielded pendant, but suggest using their standard (coiled) pendant. They will send a sample for review if you would like to evaluate this material.

A: A cut-resistant, coiled pendant is acceptable.

102. Q: Page 24, Section IV Chassis Specifications: We request approval to have the chassis pre-delivery inspection performed by our mechanic who is authorized by the chassis manufacturer to perform this inspection.

A: This is acceptable to the State.

103. Q: Page 24, Section A. Chassis: We request approval to provide a cutaway Shuttle Bus chassis.

A. This specification will remain as specified.

104. Q: Page 25, Section I. Battery:

a. We request approval to provide the chassis OEM batteries which have a combined CCA rating of 650 for the gas chassis and 750 for the diesel chassis.

A: This specification will remain as specified. The combined CCA rating is 1250 minimum.

b. We request approval to provide a battery tray as shown on the attached drawing, 0410430. Please advise if this meets your requirement for a "totally enclosed" compartment.

A: This tray is acceptable if its stainless steel and meets or exceeds specifications.

c. We request approval to provide our standard thumb locks.

A: This specification will remain as specified.

105. Q: 26, Section J. Battery Cable and Grounds.: In addition to the OEM chassis ground straps (engine and frame), we provide two gauge bonding grounds at the front and rear of our welded cage structure. This meets all grounding requirements necessary for this application. Approval is requested.

A: This is acceptable if it meets or exceeds specifications.

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106. Q: Page 27, N. Fuel Tanks: In lieu of a protective cage, we request approval to provide a tank that is inboard on the frame rails. Approval is requested.

A: This specification will remain as specified.

107. Q: Page 27, Section O. Hazard Flashers: We request approval for the chassis OEM flasher and control. It is both reliable, and covered by the chassis warranty.

A: Please refer to the answer in Question #17.

108. Q: Page 31, Section B. Electrical, 4.: We request approval to mount the heater module on the back of the electrical panel. It is easily accessible in this location.

A: This specification will remain as specified.

109. Q: Page 33. Air Conditioning System:
a. Our supplier has requested that the suggested source company name be changed from A.C. Industries to Carrier Transicold. Carrier purchased A. C. Industries.

A: Please refer to the answer in Question #27.

b. Carrier requests approval of their new Microchannel condenser coil made of aluminum tubing which is superior in heat transfer (more primary surface area), and corrosion resistance (due to the removal of the galvanic couple and the inclusion of the zinc plasma coating) to the specified copper tubing. Reference the attached information.
A: Please refer to the answer in Question #28.

c. Carrier's new K-410 roof mounted condenser is only 5.71" high vs. their old KR-3 model which is 10.58" high. Is a separate branch guard still required with the new lower profile condenser?

A: Please refer to the answer in Question #29.

110. Q: Page 35., Manual Entrance Door: The manual door control rod impinges into the door opening, resulting in a 28" clear opening in this area. We request an exception to the 30" opening in this one area.

A: This specification will remain as specified.

111. Q: Page 36, Section D. Auxiliary Air Heater System: Espar is requesting confirmation that a 7 day timer is required with the air heater. This heater is normally installed with a dash mounted rheostat control in lieu of a 7 day timer. The rheostat is much easier to operate, although diagnostics are not automatically displayed.

A: This specification will remain as specified.

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112. Q: Page 36, Section E. Power Seat Base for Driver's Seat: We request approval to provide an aftermarket seat base supplied by Adnik. This will eliminate the need to special order a chassis for this feature.

A: This is acceptable if it meets or exceeds the specifications.

113. Q: Page 39, Section O. Two-way Radio Power: We request approval to provide metal Greenleaf conduit rather than plastic conduit. It is more durable and provides better RF shielding.

A: This is acceptable if it meets or exceeds the specifications.

114. Q: 42. Section B. Manufacturer's Quality Control: We request approval to conduct the water test on the completed bus. We have no way to conduct water testing prior to the installation of interior trim and insulation.

A: This specification will remain as specified.

115. Q: Page 43. Section C. Air Conditioning Certification: We request approval to have the performance testing conducted by representatives of the a/c supplier.

A: Please refer to the answer in Question #25.

116. Q: Page 43. Section D.: Please delete the requirement for a chassis dynamometer. There is no way to provide this feature if the test is conducted in natural cold climate conditions and very few facilities offer this feature.

A: This specification will remain as specified.

117. Q: Page 44. Section F. Warranty: The chassis warranty is provided and administered by the chassis manufacturer. The body will be provided and installed by a manufacturer qualified by the chassis manufacturer. However, the chassis manufacturer remains responsible for their warranty.

A: This is acceptable to the State.

118. Q: Page 1, Section 1, Specifications: The specs state, "The successful contract shall have a factory dealer with repair facilities and personnel in Michigan". Mandating that the factory have a dealer in the state is showing a geographic preference. FTA regulations prohibit geographic preference for bus procurements. We recommend changing this section to state " representative" instead of "factory dealer" for companies without a dealer in the state.

A: Please refer to the answer in Question #30.

119. Q: Page 1, Section 1, Specifications: Please accept that our single wheelchair buses may exceed 21' 11" in length to meet proposed floor plan requirements and ADA requirements.

A: Please refer to the answer in Question #5.

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120. Q: Page 2, Section II, Welding: Please accept that our welds will be treated with primer but will not then be painted.

A: This specification will remain as specified.

121. Q: Page 2 and 7, Section B & D, Body Specs & Stepwell: Please accept that our attachment hardware meets the salt spray test but has not been tested for humidity.

A: This specification will remain as specified.

122. Q: Page 3 & 12, Section B & M, Undercoating: Please accept the interior of the box type tubing will not be coated with corrosion resistant material.

A: This specification will remain as specified.

123. Q: Page 3, Section B, C, D & F, Body Structure:

a. Please accept that the primer used on structural members will not be zinc based. Information provided.

A: This specification will remain as specified.

b. Please accept that most major bus manufacturers use a luan substrate in the manufacture of their buses. By not allowing the use of a wood substrate, restricts the competitive bidding of this RFP.

A: This specification will remain as specified.

c. Please accept the exterior side panels will be .040 aluminum and the roof panel will be .040 FRP.

A: This specification will remain as specified.

d. Please clarify the following: The specs state that "All exposed door frame structure shall be made of 304 stainless steel, acid –etched, coated with zinc based primer and powder coated OEM white (including fasteners)" What exactly is a door frame structure? Are you referring just to the dormer for the lift door? In regards to the fasteners, do you mean the piano hinges?

A: The entire door frame structure including the dormer for the lift door and the hinges.

e. Please accept that the rear cap will be ABS plastic not fiberglass or FRP.

A: This specification will remain as specified.

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f. Please delete requirement for fender flares added to the Ford front wheel wells.

A: This specification will remain as specified.

124. Q: Page 7, Section 1-3, Passenger Door:

a. Please clarify the following: The spec states that "any door with an exposed (metal showing) outer frame shall be made of 304 stainless steel, acid etched, coated with zinc based primer and powder coated OEM white (including fasteners)" What exactly is an "exposed outer frame"? What part of entry way has to be 304 stainless?

A: This specification will remain as specified. Stainless steel is required for any area where metal is visible and exposed to the elements. The goal is to eliminate any areas of corrosion.

b. Please accept that the clear opening of the entry door when measured between the open door panels will be 32". When measured between entry grabs it will be 29 ¾".

A: This specification will remain as specified.

c. Please accept that the entry door header will be from A&M. Information provided.

A: Please refer to the answer in Question #41.

d. Please accept the switch for the entry door will be a different color (back light will be red instead of green), but it will not be labeled open and closed.

A: This specification will remain as specified.

125. Q: Page 7, Section D, Passenger Stepwell:

a. Please clarify the following: The spec states that "all metal trim hardware in the stepwell area shall be stainless steel" What part of the entry way has to be 304 stainless?

A: This specification will remain as specified. All steps, step wells, fasteners, and trim shall be stainless steel. The goal is to eliminate any areas of corrosion.

b. Please accept that our ground to first step will range between 11 ½" and 12 ½" depending on where the measurement is taken and if the bus is loaded or not.

A: This specification will remain as specified.

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c. Please clarify the following: The spec states that "any interior stainless steel except for exposed door frames shall be brushed, not painted". What are you exactly referring to?

A: A shiny finish is not acceptable. A brushed texture is required to dull the stainless steel finish.

126. Q: Page 8 and10, Section E & G5, Interior: Please approve mounting some interior decals on clear plexiglass plates in lieu of metal plates.

A: This specification will remain as specified.

127. Q: Page 9, Section G 1,2 & 4, Emergency Exits:

a. Please clarify the following: The specs states that "all exposed exit door frame/jamb structure shall be made of 304 stainless steel, acid –etched, coated with zinc based primer and powder coated OEM white (including fasteners)" What exactly is a "door frame/jamb structure"? By fasteners, do you mean the piano hinges?

A: The frame/jamb is the structure where the emergency exit door is attached to. It included the all fasteners and hinges.

b. Please accept that the glass in the emergency door will be AS-3, which is the industry standard, in lieu of AS-2.

A: This specification will remain as specified.

c. Please clarify the following: The specs states that "any door with an exposed (metal showing) outer frame/jamb shall be made of 304 stainless steel, acid –etched, coated with zinc based primer and powder coated OEM white (including fasteners)" What exactly is an " exposed outer frame"? What part has to be 304 stainless?

A: The frame/jamb that is visible and exposed to the elements that could potentially cause a corrosion issue. All material shall be 304 stainless steel.

d. Please clarify the following: What is a non-closing static exhaust vent?

A: Please contact DMA 1122, Specialty Manufacturing Co, or Transpec Inc. as they can provide the exact product details.

128. Q: Page 12, Section M.1, Undercoating: Please accept Tectyle 517 undercoating in lieu of Tectyle 121-B. Information provided.

A: This specification will remain as specified.

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129. Q Page 12, Section M.2, Rustproofing: Please accept Nanochem gray primer in lieu of Waxoly or Ziebart. Information provided.

A: This specification will remain as specified.

130. Q: Page 12, Section O, Exterior Mirrors: Please clarify the following: Does the crossover mirror have to be remote adjustable?

A: Yes, as specified, it is required to be remote adjustable.

131. Q: Page 13, Section P.2., Passenger Seats: Please accept, per Freedman, seats for small buses do not have to meet complete white book standards. They do however, meet all applicable federal standards.

A: This specification will remain as specified.

132. Q: Page 14, Section P.4., All Seats: Please clarify the following: The specs states that the seat cushions have to be completely enclosed with cloth type fabric. Does it need to be the same fabric the seat is covered in or can it be a different fabric that has the same flame and smoke characteristics as the seat fabric?

A: Please refer to the answer in Question #52 .

133. Q: Page 14, Section 2c., Seats: Please clarify the following: page 14 item (C) requires grab handles on the top of the seat for single passenger. Page 13 item (B) states that grab handles are NOT required on seats that have a back against a wall. All of your floor plans that have a single seat show flip seats, and have a back against the wall.

A: Handles are not required on single seats that have a back against the wall.

134. Q: Page 14, Section 2e., Arm Rests: Please verify that you only want arm rests on aisle facing seats and not arm rests on forward facing seats next to the aisle.

A: As specified, arm rests are required on the aisle facing seats only.

135. Q: Page 15, Section P. 4.3., All Seats: Please accept that the seat back depth for Freedman Featherweight seat is 4" at some points in lieu of the 3 ½" overall.

A: This is acceptable providing all seats meet the 27" minimum knee to hip room as specified.

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136. Q: Page 17, Section Q. 7, Handrails, Stanchions: Please accept that there will not be a vertical stanchion or horizontal grab on the front side of the entry steps. This is the cab area and the requested items are not necessary for ADA or safe entry into the bus and they will impede view through the transition window.

A: This specification will remain as specified.

137. Q: Page 18, Section S, Exterior Lighting:

a. Please accept that Maxxima LED lights in lieu of Trucklite or Peterson. Information provided.

A: This is acceptable if meets or exceeds the specifications.

b. Please accept our surface mounted LED clearance and marker lights form Trucklite in lieu of 2" round flush mount lights. Photo provided.

A: This is acceptable if meets or exceeds the specifications.

c. Please accept that a jack nut will not be used to secure the license plate mount, however, stainless steel screws will be used.

A: This specification will remain as specified.

138. Q: Page 19, Section U, Heating: Please accept that Ford does not state the performance data regarding the front heat system. It is unknown if the criteria stated under U.2 will be met by the chassis heater.

A: This specification will remain as specified.

139. Q: Page 20, Section V, Windows: Please clarify the following: What is "double density "safety glass? Is a Thermopane window being required? If not, define "double density".

A: Please refer to the answer in Question #59.

140. Q: Page 22, Section Y, Type 1 Lift:

a. Please clarify the following: The spec states that the successful bidder shall deliver the lift-equipped bus with the type of lift equipment requested by the state. What manufacture do you prefer?

A: Suggested sources are listed in the specifications.

APPENDIX E
ADDENDUM #3 – QUESTIONS AND ANSWERS

b. Please clarify the following: The specs states that "all exposed exit door frame/jamb structure shall be made of 304 stainless steel, acid –etched, coated with zinc based primer and powder coated OEM white (including fasteners)" What exactly is a "door frame structure"? Are you referring just to the dormer for the lift door? By fasteners, do you mean the piano hinges?

A: The entire door frame structure includes the dormer for the lift door and the hinges.

c. Please accept that the W/C lift will be mounted to the floor only, per the manufactures instructions. It will not be mounted to the wall.
A: Accepted if it meets manufacturer's instructions.

g. Please accept that the lift control cord will be pig tailed, not enclosed in protective conduit.

A: Please refer to the answer in Question #101.

h. Please accept that the lift comes in one color only. There is no choice of colors.

A: This specification will remain as specified.

141. Q: Page 24, Section III.3., Wheel Chair Securement: Please accept the securement wall anchorage point for the shoulder belt will be 11-gauge cold-rolled steel, which will be fully enclosed and will not be subject to corrosion in lieu of stainless steel.

A: This specification will remain as specified.

142. Q: Page 25, Section H, Differential: Please clarify how the axle must be marked if synthetic oil is used.

A: This specification will remain as specified.

143. Q: Page 25, Section I, Battery: Please accept that the dual batteries will be standard from Ford and will be Motorcraft batteries in lieu of Delco.

A: Please refer to the answer in Question #15.

144. Q: Page 26, Section J, Battery Cables: Please accept that some ground straps will be secured with self tapping screws combined with W star washers which meets QVM requirements and some will be bolted as specified.

A: This is acceptable if it meets or exceeds specifications.

APPENDIX E
ADDENDUM #3 – QUESTIONS AND ANSWERS

145. Q: Page 27, Section K, Alternator: Please accept that Ford does not offer a 200 AMP alternator. We will provide a 155 AMP alternator with a 5.4L engine and a 195 AMP alternator with a 6.8L engine.

A: The 155 amp alternator is not acceptable. The 195 amp alternator is accepted as previously answered in Question #16.

146. Q: Page 27, Section O, Hazard Flasher: Please accept that the standard hazard control switch from Ford is located on the top the steering column.

A: Please refer to the answer in Question #17.

147. Q: Page 28, Section T, Tires: Please accept that the tires will be LT225/75Rx16E as specified. They will not be the largest size available from Ford.

A: The LT225/75Rx16E tire is acceptable providing it meets the GVW rating and meets or exceeds the specifications.

148. Q: Page 30, Section Z, Exhaust System: Please note that the exhaust pipe will terminate as specified, however, this may not provide maximum ground clearance, and departure angle.

A: This specification will remain as specified.

149. Q: Page 31-32, Section B, Electrical:

a. Please accept that the breaker for the lift will be installed in the battery box for easier access in lieu of under the hood.

A: Please refer to the answer in Question #18.

b. Please accept the wiring for the Trans/Air will be color coded only.

A: This specification will remain as specified.

c. Please accept that we use an over molded, rubber sealed, positive lock connector in lieu of the heat shrink tubing.

A: This specification will remain as specified.

150. Q: Page 32, Section A.1-4, Air Conditioning:

a. Please accept that the specified tie-in system from Trans/Air will not meet performance specifications. A dual compressor 'Super System' will meet the specs.

A: This specification will remain as specified.

b. Please accept that the Trans/Air fittings are tested to ASTM B117 for 360 hours in lieu of ASTM D117.

A: This specification will remain as specified.

APPENDIX E
ADDENDUM #3 – QUESTIONS AND ANSWERS

c. Please accept that the Trans/Air condenser is not vinyl coated.

A: This specification will remain as specified.

d. Please accept our Trans/Air proposed evaporator (TA73) will meet specs at 1600cfm.

A: This specification will remain as specified.

e. Please accept that the Trans/Air drain pan is ABS.

A: This specification will remain as specified.

151. Q: Page 32, Option A, Air Conditioning:

a. Please accept ACC Climate Control as an approved equal to Trans Air and Carrier.

A: This specification will remain as specified.

b. Please accept that ACC uses an orifice and accumulator in lieu of expansion valve and dryer and puts the low-pressure switch between the evaporator and accumulator and high-pressure switch between the condenser and evaporator.

A: This specification will remain as specified.

c. Please accept that ACC will use (2) 14" fans in lieu of (3) 10" fans, which produces comparable performance with less amp draw.

A: This specification will remain as specified.

d. Please accept that ACC uses fuses and manual re-set breakers in lieu of automatic breakers as a safety precaution.

A: This specification will remain as specified.

e. Please accept that ACC will use Atco "AN" style Air-O-Crimp fittings that features a 1 piece design and multiple deep grooves in lieu of elastomeric seals to create a leak free seal (Atco's current design does meet the specification and may be available if required).

A: This specification will remain as specified.

152. Q: Page 36, Section B, Manual Entrance Door: Please accept that the flexible seal on the entry door is not 12" in width as specified. Each door panel has a cushion of 2 ½".

A: This specification will remain as specified.

APPENDIX E
ADDENDUM #3 – QUESTIONS AND ANSWERS

153. Q: Page 36, Section D, Auxiliary Air Heater System: Please accept that the plug for the engine heater will be located in the grill and will not be moved.

A: This specification will remain as specified.

154. Q: Page 37, Section H, Engine Shutdown System: Please delete this option. Ford does not recommend these systems or do they offer one of its own. Installation of such a system could void the Ford warranty.

A: This specification will remain as specified.

155. Q: Page 37, Section K, Rear Emergency Exit Window: Please accept that the glass in the optional rear egress window will be 1054 Sq. inches in lieu of 1200 Sq. inches. The rear emergency window meets FMVSS Part 38 "ADA" and FMVSS 217 "Bus Window Retention and Release requirements".

A: This specification will remain as specified.

156. Q: Page 38, Section N, Rear Five Place Passenger Seat: Please accept that the optional center seat on the rear row will not have an under seat retractor seat belt as there is not enough room. Seat belt will have a lap retractor.

A: This specification will remain as specified.

157. Q: Page 41, Section VII, Manufacturer Requirements:

a. Please clarify the following: What is a standard manufacturer's production option sheet/decal for chassis and body?

A: This is a standard production tag on every chassis usually mounted near the radiator. Contact the chassis manufacturer for further information.

b. Please clarify the following: What is a service broadcast sheet?

A: The service broadcast sheet is standard with the chassis manufacturer and similar to the Ford QVM. Contact the chassis manufacturer for further information.

158. Q: Page 44, Section F.7., Chassis Warranty: Please accept the chassis will be warranted by the chassis manufacture.

A: This is acceptable to the State.

159. Q: Page 45, Section G., Miscellaneous: Please clarify the following: Two pilot buses are required. One gas and one diesel. Does the A/C pull down test have to be performed on both buses or just one? If one, which one?

A: The A/C pull down test must be performed on the diesel bus only.

APPENDIX E
ADDENDUM #3 – QUESTIONS AND ANSWERS

160. Q: Page 45, Section VIII, Bid Documents: Please accept that the floor plan drawings will not be to scale, but will show the required details.

A: Not to scale drawings are acceptable providing they meet or exceed the specifications. Drawings shall have the appropriate measurements and a notation "drawing not scale."

161. Q: Page 37, Section 2.1.1.1. RFP: The specs state, "The successful contract shall have a factory dealer with repair facilities and personnel in Michigan". Mandating that the factory have a dealer in the state is showing a geographic preference. FTA regulations prohibit geographic preference for bus procurements. We recommend changing this section to state " representative" instead of "factory dealer" for companies without a dealer in the state.

A: Please refer to the answer in Question #30.

162. Page 55, Section 2.243, Liquidated Damages: Please remove the liquidated damages of $5,000 for late delivery. This is excessive in comparison to other state contracts.

A: Please refer to the answer in Question #2.

163. Page 76, Section 4.044, Certification of MI. Business: Please remove this section as it shows a geographic preference. FTA regulations prohibit geographic preference for bus procurements.

A: This section is for data collection purposes and still shall be completed and submitted with bidder's proposals. However, per the FTA, in-state or local geographical preferences in the evaluation of bids or proposals shall be excluded except in those cases where applicable Federal statutes expressly mandate or encourage geographic preference. Therefore, any Michigan preference as stated in Public Act 431 of 1948 does not apply to this RFP.

164. Q: Page 82, Section 5.04 Past Performance: Please remove "with the State" as it shows a geographic preference.

A: The reference to "with the State" is deleted. However, the State is still interested in evaluating information on vendor's experiences with other states and/or projects with the same size, scope, and complexity as this RFP.

APPENDIX E
ADDENDUM #3 – QUESTIONS AND ANSWERS

165. Q: Page 84, Appendix A, Cost Model:

a. Please clarify the following: Are the options included in the evaluation price?

A: Yes.

b. Please clarify the following: Where is item K on the price form?

A: "K" is the options section.

166. Q: Page 2, Section B.1.a: The roadside and curbside wall structures shall be constructed of 1 ½" x 1 ½" 18 ga. "Flow Coat" galvanized wall bows welded on 24" centers, modified galvanized C-Channel bottom rail and 1 ½" galvanized angle top rail.

A: This specification will remain as specified.

167. Q: Page 3, Section B.1.b: The floor structure shall be constructed of 2" x 2" 13 ga. "Flow Coat" galvanized cross members welded on 24"centers. A galvanized longitudinal hat channel shall run entire length of floor welded to cross members.

A: This specification will remain as specified.

168. Q: Page 3, Section B.1.c: Exterior skin shall be made up of .024 galvanized steel laminated to 2.4mm lauan. Interior panels shall be gray vinyl covered lauan.

A: This specification will remain as specified.

169. Q: Page 3, Section B.1.c: Request exterior door frames to be: 1/8" aluminum

A: This specification will remain as specified.

170. Q: Page 3, Section B.1.c: Request exterior panel substrate to be: Luan

A: This specification will remain as specified.

171. Q: Page 4, Section B.1.f: Request rubber fender splash guards to be: standard ABS Material

A: Please refer to the answer in Question #6.

172. Q: Page 4, Section B.1.f: Request rubber fender splash guards to be installed at the Front wheel openings to be: standard OEM fender

A: Please refer to the answer in Question #6.

APPENDIX E
ADDENDUM #3 – QUESTIONS AND ANSWERS

173. Q: Page 4, Section B.1.f: Request rubber fender splash guards to be installed after the finish coat of paint is applied to the bus.

A: This specification will remain as specified.

174. Q: Page 7, Section C.1: Request outer frame to be: 1/8" aluminum

A: This specification will remain as specified.

175. Q: Page 7, Section D: Request: Step Height from Ground: 12 ½"

A: This specification will remain as specified.

176. Q: Page 8, Section E.1: Request: Door latch to be: Austin Hardware AH1200SS

A: This specification will remain as specified.

177. Q: Page 8, Section E.2: Cannot guarantee damage from graffiti removing chemicals unless we know what is being used.

A: This specification will remain as specified.

178. Q: Page 9, Section F.4: Request: Flooring in wheelchair area to be "ribbed" rubber Not "smooth" rubber

A: Please refer to the answer in Question #9.

179. Q: Page 9, Section G.1: Request: exterior door frames to be: 1/8" aluminum

A: This specification will remain as specified.

180. Q: Page 9, Section G.2: Request: exterior door frames to be: 1/8" aluminum

A: This specification will remain as specified.

181. Q: Page 15, Section 4.a.7: CMI Nanocide Dimensions does not meet Doc 90 and is also not a "cloth" material

A: Please refer to the answer in Question #10.

182. Q: Page 15, Section 4.b.3: CMI Nanocide Dimensions does not meet Doc 90

A: Please refer to the answer in Question #10.

183. Q: Page 18, Section 8.2: Exterior LED Lights to be "Sound Off" brand

A: This is acceptable if it meets or exceeds the specifications.

APPENDIX E
ADDENDUM #3 – QUESTIONS AND ANSWERS

184. Q: Page 18, Section 8.3: Exterior LED Lights to be "Sound Off" brand

A: This is acceptable if it meets or exceeds the specifications.

185. Q: Page 18, Section 8.4: Exterior LED Lights to be "Sound Off" brand

A: This is acceptable if it meets or exceeds the specifications.

186. Q: Page 20, Section V.1: Request: 20% light transmitting tint

A: This specification will remain as specified.

187. Q: Page 20, Section W.2: Request: Paint to be applied after all manufacturing is completed.

A: This is acceptable if it meets or exceeds the specifications.

188. Q: Page 25, Section I: Battery box door to have full length hinge from door Manufacture.

A: This is acceptable if it meets or exceeds the specifications.

189. Q: Page 27, Section K: Request: Alternator warranty to be vendor "standard" which is 2 years

A: This specification will remain as specified.

190. Q: Page 27, Section P: Request: Standard OEM shock absorbers-gas 35 type millimeter

A: This is acceptable if it meets or exceeds the specifications.

191. Q: Page 30, Section B.1: Request: Circuit breaker for lift will be located in the Battery box

A: Please refer to the answer in Question #18.

192. Q: Page 34, Section B.1: Request: outer frame to be: 1/8" aluminum

A: This specification will remain as specified.

193. Q: Page 34, Section C.Par 1: Request: Cold Climate Package to be aftermarket not OEM

A: This is acceptable if it meets or exceeds the specifications.

APPENDIX E
ADDENDUM #3 – QUESTIONS AND ANSWERS

194. Q: Page 40, Section A.6: Request: Request deletion of this manual

A: This specification will remain as specified.

195. Q: Page 41, Section A.15: Request: Towing instructions will be for "rear" end towing only

A: This specification will remain as specified.

196. Q: Page 1, 4th paragraph: Cannot do a rear lift application on a 21' 11" body due To the fact that there is not enough room between the Rear wheel and end of bus to place a lift.

A: Please refer to the answer in Question #5.

197. Q: In the RFP boiler plate language it appears to me that proposers are requested to submit one original and four paper copies of our proposal. What is not clear to me is if one electronic copy is also required. The language seems to indicate that an electronic copy "may" be required. Does Michigan want either: 1) a scanned electronic copy on CD of every thing we submit in hard copy, 2) the RFP section that you made available in Word format only, or 3) nothing needs to be submitted in electronic format?

A: Bidders are to submit 1 original and 3 copies. In addition, all information included in the proposal shall be included on one floppy disc or CD. The responses to the RFP document shall be in Word format.

APPENDIX F
Small Bus (Cutaway bid)
#07119200053
Bidder Clarifications
Page 1 of 3

Shepard Brothers:

1. Coach and Equipment specifies 1.5" x 1.5" square 18 gauge galvanized steel tube for the entire tube structure of the roll cage. The MDOT specification has a 16 gauge minimum steel for the structure. Can Coach and Equipment upgrade the structure with 16 gauge steel?

   See answer below question 2.

2. Coach and Equipment specifies a 24 gauge steel skin. The MDOT specification specifies a 20 gauge minimum for all exterior side and roof panel material. Can Coach and Equipment upgrade the skin to 20 gauge steel skin?

   Coach and Equipment can and will make the necessary changes to sheet and tube gauges for a $700.00 per unit price increase if required.

   That being said, C&E strongly recommends that MDOT consider the proposal as offered. C&E feels that the metal gauges as proposed are an integral part of their body structure, which is a fine balance between strength, service life, and weight and gas mileage. The structural integrity of the proposed design has been proven via rigorous and repeated testing. A 7-year Altoona test in which the C&E vehicle didn't experience a single structural failure, a rarity in the industry, and a particular point of pride for Coach and Equipment. An industry first FMVSS 214 Side Impact crash test during which a 4000 lbs test sled was driven directly into the side of the body. The damage was so minimal that the vehicle was driven from Wisconsin back to western New York with out needing repair. At the behest of long-time and current customer NYC MTA, C&E has submitted their structure to a comprehensive finite element analysis resulting in the use of high strength, low alloy steel in all C&E floor cross members. At no point did the analysis determine that our tube structure or side wall sheet metal was inadequate for the heavy stresses encountered when going through large pot holes or running up on curbs and other twisting or jerking road environments. . C&E is currently, and has been for over 20 years building buses specifically for the harsh environments and duty cycles that MDOT agencies experience. Almost every major transit authority in the North East currently runs C&E vehicle bodies in their fleets, specifically due to the benefits associated with their already heavy-duty body design. Lastly, we have received numerous anecdotal accounts of accidents in which our vehicles had either received heavy damage or rolled over completely and the body structure still maintained its intended integrity.

APPENDIX F
Small Bus (Cutaway bid)
#07119200053
Bidder Clarifications
Page 2 of 3

C&E feels that changing gauges will offer little improved performance from a service life standpoint and will only make units heavier thus negatively impacting fuel mileage. Thus, ultimately leading to a vehicle that is more expensive to operate on a per mile basis. Additionally, C&E prides itself on the smooth running of its material delivery and routing processes to the build line. Adding more metal gauges beyond our standard design adds complexity to the product which increases both mistakes and delays. The requested changes will add cost to our operation without providing commensurate benefits to you the customer. Steel mills also traditionally set large minimum quantities on what they will sell, driving up our inventory costs.

As you can see, C&E firmly believes that the body as offered is best solution for MDOT and its agencies. We therefore request relief from these specifications, but if they cannot be waived, we will comply for the price stated above.

We would also like to offer for the State of Michigan's consideration the use of fiberglass reinforced plastic [FRP] sidewalls, rear panel and roof panels. Should the State of Michigan prefer FRP panels in these areas please add $400.00 per bus to our original proposal price. This $400 price includes our standard gauge steel structure which will be coated per Michigan specifications. If Michigan wants the 16 gauge structure and FRP panels the price is an additional $700.00 per bus. Again, we believe our original offering will meet and exceed performance and life expectancy requirements. To clarify and provide further details to this original FRP proposal the standard Phoenix model bus equipped with our optional FRP panels still relies on the following steel exterior panels:

1) lift door and optional emergency door panels constructed of 18 gauge sub-structure and 22 gauge skins ,
2) non-structural 24 gauge steel skirt panels/skins,
3) right side [curbside] 24 gauge steel transition panel, and
4) left side [road side] 18 gauge steel transition panel.

As a result of our March 5, 2009 discussions, should the State of Michigan desire for an additional $100 we are willing to upgrade both our standard non-structural 24 gauge steel skirt panels and the curbside 24 gauge transition panel to 18 gauge steel.

3. The MDOT specifications and question # 81, as clarified in the addendum # 3, specifies all interior lighting for stepwells, overhead entrance, and courtesy lights as LED. Can Coach and Equipment upgrade to all LED interior lighting?

Our bus as originally proposed included LED dome lights in the entry area which was our understanding and interpretation of the Michigan requirement as addressed in the specifications and answers to bidders. If Michigan wants the interior passenger compartment dome lights to also be LED instead of our standard incandescent lights then we will need to add $126.00 dollars to our proposal price.

APPENDIX F
Small Bus (Cutaway bid)
#07119200053
Bidder Clarifications
Page 3 of 3

4. On Appendix A Evaluation form, sectionIV.Q.2 Rear Suspension, Shepard Brothers lists "per spec: Ford OEM leaf with added assist. Please clarify the product name that Coach and Equipment is providing the added assist?

   Mor Ryde System: Pursuant to Michigan specifications we are offering the MorRyde RL rear suspension system. This is the system suggested by Michigan in the specifications. If you refer to the Equipment Lists in our proposal, Appendix Tab 6 [and alternative proposal Appendix Tab 10], you will see this suspension system listed under chassis modifications.

5. MDOT accepts the Ford OEM electronically controlled circuit for the hazard flasher. As specified, can Coach and Equipment provide a dash mounted hazard flasher switch in addition to the column mounted Ford OEM hazard switch?

   Yes, this can be done for an additional $75 per unit. However The OEM switch on the steering column will perform this function reliably and any changes we make to add a second switch will make the OEM system that much less reliable (and could cause a DTC -- diagnostic trouble code -- to be set in the vehicle's computer each time the auxiliary dash hazard switch is actuated) C&E feels that adding a redundant switch for flashers adds unneeded complexity and ultimately results in a product that is more difficult to maintain.

APPENDIX G
Altoona Bus Test Report

STURAA TEST

7 YEAR

200,000 MILE BUS

from

COACH & EQUIPMENT MANUFACTURING CORP.

MODEL PHOENIX

NOVEMBER 2005

PTI-BT-R0514

PENNSTATE

The Pennsylvania Transportation Institute

201 Research Office Building
The Pennsylvania State University
University Park, PA 16802
(814) 865-1891

Bus Testing and Research Center

2237 Old Route 220 N.
Duncansville, PA 16635
(814) 695-3404

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EXECUTIVE SUMMARY

Coach & Equipment submitted a model Phoenix, diesel-powered 15 seat (including the driver) 25-foot bus, for a 7 yr/200,000 mile STURAA test. The test bus is built on a Ford E-450 Super Duty chassis. The odometer reading at the time of delivery was 595.0 miles. Testing started on August 22, 2005 and was completed on November 11, 2005. The Check-In section of the report provides a description of the bus and specifies its major components.

The primary part of the test program is the Structural Durability Test, which also provides the information for the Maintainability and Reliability results. The Structural Durability Test was started on September 1, 2005 and was completed on November 4, 2005.

The interior of the bus is configured with seating for 15 passengers including the driver and 2 wheelchair positions. Free floor space will accommodate 12 standing passengers resulting in a potential capacity of 27 persons and 2 wheelchair positions. At 150 lbs per person and 600 lbs per wheelchair position, this load results in a measured gross vehicle weight of 15,370 lbs. In order to avoid exceeding the GAWR (9,450 lbs) of the rear axle, ballast for all 12 standing passengers and one wheelchair position was eliminated. This reduction from full capacity resulted in an adjusted measured gross vehicle weight of 13,410 lbs and was used for all dynamic testing. The middle SLW segment was performed at the same 13,410 lbs and the final segment was performed at a CW of 10,600 lbs. Durability driving resulted in unscheduled maintenance and failures that involved a variety of subsystems. A description of failures, and a complete and detailed listing of scheduled and unscheduled maintenance are provided in the Maintainability section of this report.

Accessibility, in general, was adequate. Components covered in Section 1.3 (Repair and/or Replacement of Selected Subsystems), with the exception of the alternator, were found to be readily accessible and no restrictions were noted. Test Technicians encountered limited space when attempting to access the alternator.

The Reliability section compiles failures that occurred during Structural Durability Testing. Breakdowns are classified according to subsystems. The data in this section are arranged so that those subsystems with more frequent problems are apparent. The problems are also listed by class as defined in Section 2. The test bus encountered no Class 1, 2 or 4 failures. Of the seven reported Class 3 failures, five occurred in the suspension system and two with the engine/transmission.

The Safety Test, (a double-lane change, obstacle avoidance test) was safely performed in both right-hand and left-hand directions up to a maximum test speed of 45 mph. The performance of the bus is illustrated by a speed vs. time plot. Acceleration and gradeability test data are provided in Section 4, Performance. The average time to obtain 50 mph was 16.39 seconds.

The Shakedown Test produced a maximum final loaded deflection of 0.144 inches with a permanent set ranging between -0.003 to 0.005 inches under a distributed

static load of 11,325 lbs. The Distortion Test was completed with all subsystems, doors and escape mechanisms operating properly. Water leakage was observed during the test at the left side emergency window frame and the frame of the roof hatch.

The test bus was not equipped with any type of tow eyes or tow hooks, therefore, the Static Towing Test was not performed. The Dynamic Towing Test was performed by means of a front-lift tow. The towing interface was accomplished using a hydraulic under-lift wrecker. The bus was towed without incident and no damage resulted from the test. The manufacturer does not recommend towing the bus from the rear; therefore, a rear test was not performed. The Jacking and Hoisting Tests were also performed without incident. The bus was found to be stable on the jack stands, and the minimum jacking clearance observed with a tire deflated was 8.1 inches.

A Fuel Economy Test was run on simulated central business district, arterial, and commuter courses. The results were 6.84 mpg, 7.12 mpg, and 11.16 mpg respectively; with an overall average of 7.78 mpg.

A series of Interior and Exterior Noise Tests was performed. These data are listed in Section 7.1 and 7.2 respectively.

ABBREVIATIONS

ABTC	-	Altoona Bus Test Center
A/C	-	air conditioner
ADB	-	advance design bus
ATA-MC	-	The Maintenance Council of the American Trucking Association
CBD	-	central business district
CW	-	curb weight (bus weight including maximum fuel, oil, and coolant; but without passengers or driver)
dB(A)	-	decibels with reference to 0.0002 microbar as measured on the "A" scale
DIR	-	test director
DR	-	bus driver
EPA	-	Environmental Protection Agency
FFS	-	free floor space (floor area available to standees, excluding ingress/egress areas, area under seats, area occupied by feet of seated passengers, and the vestibule area)
GVL	-	gross vehicle load (150 lb for every designed passenger seating position, for the driver, and for each 1.5 sq ft of free floor space)
GVW	-	gross vehicle weight (curb weight plus gross vehicle load)
GVWR	-	gross vehicle weight rating
MECH	-	bus mechanic
mpg	-	miles per gallon
mph	-	miles per hour
PM	-	Preventive maintenance
PSBRTF	-	Penn State Bus Research and Testing Facility
PTI	-	Pennsylvania Transportation Institute
rpm	-	revolutions per minute
SAE	-	Society of Automotive Engineers
SCH	-	test scheduler
SEC	-	secretary
SLW	-	seated load weight (curb weight plus 150 lb for every designed passenger seating position and for the driver)
STURAA	-	Surface Transportation and Uniform Relocation Assistance Act
TD	-	test driver
TECH	-	test technician
TM	-	track manager
TP	-	test personnel

TEST BUS CHECK-IN

I. OBJECTIVE

The objective of this task is to log in the test bus, assign a bus number, complete the vehicle data form, and perform a safety check.

II. TEST DESCRIPTION

The test consists of assigning a bus test number to the bus, cleaning the bus, completing the vehicle data form, obtaining any special information and tools from the manufacturer, determining a testing schedule, performing an initial safety check, and performing the manufacturer's recommended preventive maintenance. The bus manufacturer must certify that the bus meets all Federal regulations.

III. DISCUSSION

The check-in procedure is used to identify in detail the major components and configuration of the bus.

The test bus consists of a Coach & Equipment, model Phoenix, built on a Ford E-450 Super Duty Chassis. The bus has an OEM driver's door and a passenger door rear of the front axle. A dedicated handicap entrance equipped with a Braun Corp. model NCL917F1BRP wheelchair lift is located at the left rear of the bus, rear of the rear axle. Power is provided by a diesel-fueled, Ford model Power Stroke 6.0 Liter engine coupled to a Ford Motor Co. model Torq Shift (5-speed) transmission.

The measured curb weight is 3,860 lbs for the front axle and 6,740 lbs for the rear axle. These combined weights provide a total measured curb weight of 10,600 lbs. There are 15 seats including the driver, 2 wheelchair positions and room for 12 standing passengers bringing the total passenger capacity to 27 + 2 wheelchair positions. Gross load is 150 lb x 27 = 4,050 lbs + 1,200 lbs (2 wheelchair positions) = 5,250 lbs. At full capacity, the measured gross vehicle weight is 15,370 lbs. This value was used for all static tests. In order to avoid exceeding the GAWR (9,450 lbs) of the rear axle, ballast for all 12 standing passengers and one wheelchair position was eliminated. This reduction from full capacity resulted in an adjusted measured gross vehicle weight of 13,410 lbs and was used for all dynamic testing.

VEHICLE DATA FORM

Bus Number: 0514	Arrival Date: 8-22-05
Bus Manufacturer: Coach & Equipment	Vehicle Identification Number (VIN): 1FDXE45P26HA11956
Model Number: Phoenix	Date: 8-22-05
Personnel: T.S. & S.C.	Chassis: E-450 Super Duty

WEIGHT: *Values in parenthesis indicate the adjusted weights necessary to avoid exceeding the GAWR. These values were used for all dynamic testing.

Individual Wheel Reactions:

Weights (lb)	Front Axle		Middle Axle		Rear Axle	
	Right	Left	Right	Left	Right	Left
CW	2,040	1,820	N/A	N/A	3,540	3,200
SLW	2,080 (2,230)	2,110 (2,080)	N/A	N/A	4,850 (4,660)	4,890 (4,440)
GVW	2,240 (2,230)	2,290 (2,080)	N/A	N/A	5,370 (4,660)	5,470 (4,440)

Total Weight Details:

Weight (lb)	CW	SLW	GVW	GAWR
Front Axle	3,860	4,190 (4,310)	4,530 (4,310)	4,600
Middle Axle	N/A	N/A	N/A	N/A
Rear Axle	6,740	9,740 (9,100)	10,840 (9,100)	9,450
Total	10,600	13,930 (13,410)	15,370 (13,410)	GVWR: 14,050

Dimensions:

Length (ft/in)	25 / 4.5
Width (in)	96.0
Height (in)	111.5
Front Overhang (in)	30.5
Rear Overhang (in)	98.0
Wheel Base (in)	176.0
Wheel Track (in)	Front: 68.5
	Rear: 77.7

Bus Number: 0514	Date: 8-22-05

CLEARANCES:

Lowest Point Outside Front Axle	Location: Steering stabilizer	Clearance(in): 11.5
Lowest Point Outside Rear Axle	Location: Fuel tank support bracket	Clearance(in): 12.3
Lowest Point between Axles	Location: Battery box	Clearance(in): 7.2
Ground Clearance at the center (in)	7.2	
Front Approach Angle (deg)	25.0	
Rear Approach Angle (deg)	10.9	
Ramp Clearance Angle (deg)	4.7	
Aisle Width (in)	17.3	
Inside Standing Height at Center Aisle (in)	73.3	

BODY DETAILS:

Body Structural Type	Integral		
Frame Material	Steel		
Body Material	Steel & fiberglass		
Floor Material	Plywood		
Roof Material	Steel & fiberglass		
Windows Type	☐ Fixed	■ Movable	
Window Mfg./Model No.	Clear Vision / AS3 M3 DOT 296		
Number of Doors	1 Front	1 Rear	
Mfr. / Model No.	Ford Motor Co. / O.E.M & Coach & Equipment		
Dimension of Each Door (in)	Driver's – 31.7 x 54.3 Passenger – 32.3 x 79.5 W/C – 46.0 x 70.6 Emergency – 35.5 x 56.6		
Passenger Seat Type	☐ Cantilever	■ Pedestal	☐ Other (explain)
Mfr. / Model No.	Freedman Seating Co / 81043-L1		
Driver Seat Type	☐ Air	☐ Spring	■ Other (cushion)
Mfr. / Model No.	Freedman Seating Co / 19507-L1		
Number of Seats (including Driver)	15 + 2 handicap positions		

Bus Number: 0514	Date: 8-22-05

BODY DETAILS (Contd..)

Free Floor Space (ft^2)	19.2			
Height of Each Step at Normal Position (in)	Front	1. 10.4	2. 8.0	3. 8.3	4. N/A
	Middle	1. N/A	2. N/A	3. N/A	4. N/A
	Rear	1. N/A	2. N/A	3. N/A	4. N/A
Step Elevation Change - Kneeling (in)	N/A			

ENGINE

Type	■ C.I.	☐ Alternate Fuel	
	☐ S.I.	☐ Other (explain)	
Mfr. / Model No.	Ford Power Stroke / 6.0 Liter		
Location	■ Front	☐ Rear	☐ Other (explain)
Fuel Type	☐ Gasoline	☐ CNG	☐ Methanol
	■ Diesel	☐ LNG	☐ Other (explain)
Fuel Tank Capacity (indicate units)	57 Gals.		
Fuel Induction Type	■ Injected	☐ Carburetion	
Fuel Injector Mfr. / Model No.	Ford Power Stroke / 6.0 Liter		
Carburetor Mfr. / Model No.	N/A		
Fuel Pump Mfr. / Model No.	Ford Power Stroke / 6.0 Liter		
Alternator (Generator) Mfr. / Model No.	Alternator #1 - OEM-Ford / NA Alternator #2 - OEM-Ford / NA		
Maximum Rated Output (Volts / Amps)	Alternator #1 – 12 volts / 110 amps Alternator #2 – 12 volts / 110 ams		
Air Compressor Mfr. / Model No.	N/A		
Maximum Capacity (ft^3 / min)	N/A		
Starter Type	■ Electrical	☐ Pneumatic	☐ Other (explain)
Starter Mfr. / Model No.	Visteon / 12V 914457		

Bus Number: 0514	Date: 8-22-05

TRANSMISSION

Transmission Type	☐ Manual	■ Automatic	
Mfr. / Model No.	Ford Motor Co. / Torq Shift		
Control Type	■ Mechanical	☐ Electrical	☐ Other
Torque Converter Mfr. / Model No.	Ford Motor Co. / Torq Shift		
Integral Retarder Mfr. / Model No.	N/A		

SUSPENSION

Number of Axles	2		
Front Axle Type	■ Independent	☐ Beam Axle	
Mfr. / Model No.	Ford Motor Co. / Twin I-Beam		
Axle Ratio (if driven)	N/A		
Suspension Type	☐ Air	■ Spring	☐ Other (explain)
No. of Shock Absorbers	2		
Mfr. / Model No.	Motorcraft / C24-180-45-AA		
Middle Axle Type	☐ Independent	☐ Beam Axle	
Mfr. / Model No.	N/A		
Axle Ratio (if driven)	N/A		
Suspension Type	☐ Air	☐ Spring	☐ Other (explain)
No. of Shock Absorbers	N/A		
Mfr. / Model No.	N/A		
Rear Axle Type	☐ Independent	■ Beam Axle	
Mfr. / Model No.	Dana / M70HD		
Axle Ratio (if driven)	4:1		
Suspension Type	☐ Air	■ Spring	☐ Other (explain)
No. of Shock Absorbers	2		
Mfr. / Model No.	Motorcraft / XC25-180-80-EA		

Bus Number: 0514	Date: 8-22-05

WHEELS & TIRES

Front	Wheel Mfr./ Model No.	Accuride / 16 x 6
	Tire Mfr./ Model No.	Michelin LTX / LT 225/75R 16
Rear	Wheel Mfr./ Model No.	Accuride / 16 x 6
	Tire Mfr./ Model No.	Michelin LTX / LT 225/75R 16

BRAKES

Front Axle Brakes Type	☐ Cam	■ Disc	☐ Other (explain)
Mfr. / Model No.	TRW / 13.03"		
Middle Axle Brakes Type	☐ Cam	☐ Disc	☐ Other (explain)
Mfr. / Model No.	N/A		
Rear Axle Brakes Type	☐ Cam	■ Disc	☐ Other (explain)
Mfr. / Model No.	Kelsey Hayes / 12.90"		
Retarder Type	N/A		
Mfr. / Model No.	N/A		

HVAC

Heating System Type	☐ Air	■ Water	☐ Other
Capacity (Btu/hr)	Ford Motor Co. / OEM		
Mfr. / Model No.	Ford Motor Co. / Proair		
Air Conditioner	■ Yes	☐ No	
Location	Front dash & interior roof		
Capacity (Btu/hr)	67,000		
A/C Compressor Mfr. / Model No.	Carrier Corp. / TM-16		

STEERING

Steering Gear Box Type	Hydraulic gear
Mfr. / Model No.	XR-50 / Ford OEM
Steering Wheel Diameter	15.5
Number of turns (lock to lock)	4.0

Bus Number: 0514	Date: 8-22-05

OTHERS

Wheel Chair Ramps	Location: N/A	Type: N/A
Wheel Chair Lifts	Location: Right rear	Type: Lift
Mfr. / Model No.	The Braun Corporation / NCL917E1BRP	
Emergency Exit	Location: Windows Doors Roof hatch	Number: 2 2 1

CAPACITIES

Fuel Tank Capacity (units)	57 gals
Engine Crankcase Capacity (gallons)	3.75
Transmission Capacity (gallons)	2.375
Differential Capacity (gallons)	1.0
Cooling System Capacity (gallons)	6.9
Power Steering Fluid Capacity (gallons)	.5

VEHICLE DATA FORM

Bus Number: 0514	Date: 8-22-05

List all spare parts, tools and manuals delivered with the bus.

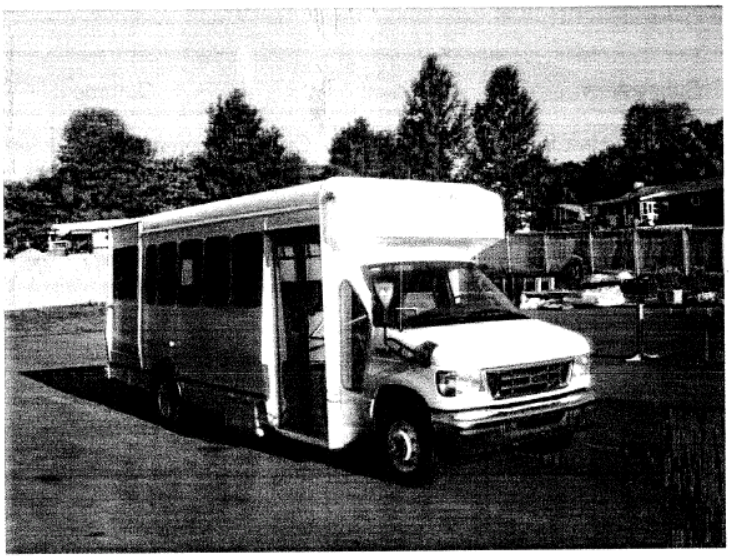
Part Number	Description	Qty.
FI-2016	Oil filter	1
AT-163-G	Shock absorbers	2
AT-164-G	Shock absorbers	2
Michelin LTX 225/75R 16	Tires	6
Accuride wheels	Wheels	6

COMPONENT/SUBSYSTEM INSPECTION FORM

Bus Number: 0514	Date: 8-22-05

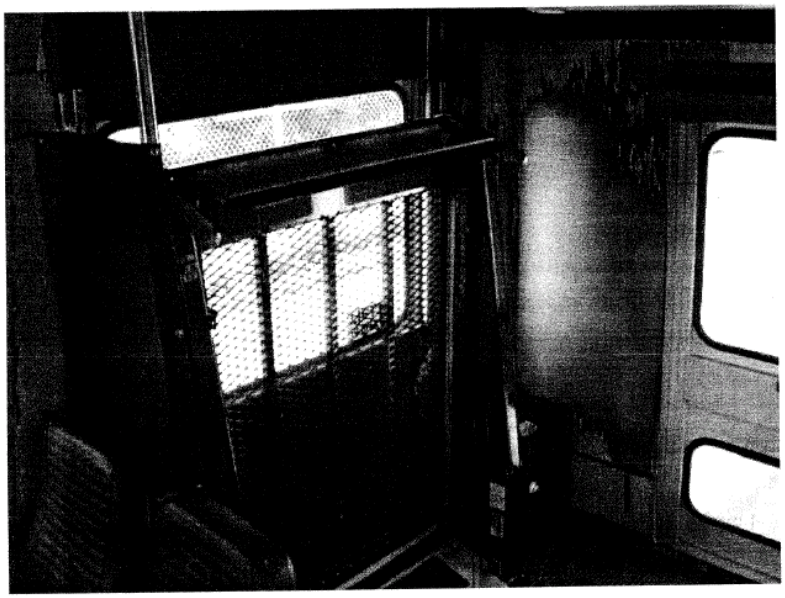
Subsystem	Checked	Comments
Air Conditioning Heating and Ventilation	✔	One A/C compressor not completely secured to the engine block.
Body and Sheet Metal	✔	
Frame	✔	
Steering	✔	
Suspension	✔	
Interior/Seating	✔	
Axles	✔	
Brakes	✔	
Tires/Wheels	✔	
Exhaust	✔	
Fuel System	✔	Diesel
Power Plant	✔	
Accessories	✔	
Lift System	✔	
Interior Fasteners	✔	
Batteries	✔	

CHECK - IN



COACH & EQUIPMENT'S MODEL PHOENIX

CHECK - IN CONT.



COACH & EQUIPMENT'S
MODEL PHOENIX EQUIPPED WITH A BRAUN
MODEL NCL917F1BRP HANDICAP LIFT

1. MAINTAINABILITY

1.1 ACCESSIBILITY OF COMPONENTS AND SUBSYSTEMS

1.1-I. TEST OBJECTIVE

The objective of this test is to check the accessibility of components and subsystems.

1.1-II. TEST DESCRIPTION

Accessibility of components and subsystems is checked, and where accessibility is restricted the subsystem is noted along with the reason for the restriction.

1.1-III. DISCUSSION

Accessibility, in general, was adequate. Components covered in Section 1.3 (Repair and/or Replacement of Selected Subsystems), with the exception of the alternator, were found to be readily accessible and no restrictions were noted. Test technicians encountered limited space when attempting to access the alternator.

ACCESSIBILITY DATA FORM

Bus Number: 0514	Date: 11/11/05

Component	Checked	Comments
ENGINE :		
Oil Dipstick	✔	
Oil Filler Hole	✔	
Oil Drain Plug	✔	
Oil Filter	✔	
Fuel Filter	✔	
Air Filter	✔	
Belts	✔	
Coolant Level	✔	
Coolant Filler Hole	✔	
Coolant Drain	✔	
Spark / Glow Plugs	✔	
Alternator	✔	Limited access.
Diagnostic Interface Connector	✔	
TRANSMISSION :		
Fluid Dip-Stick	✔	
Filler Hole	✔	Fill through dip tube.
Drain Plug	✔	
SUSPENSION :		
Bushings	✔	
Shock Absorbers	✔	
Air Springs	✔	
Leveling Valves	N/A	
Grease Fittings	✔	

ACCESSIBILITY DATA FORM

Bus Number: 0514	Date: 11/11/05

Component	Checked	Comments
HVAC :		
A/C Compressor	✔	
Filters	✔	
Fans	✔	
ELECTRICAL SYSTEM :		
Fuses	✔	
Batteries	✔	
Voltage regulator	✔	
Voltage Converters	✔	
Lighting	✔	
MISCELLANEOUS :		
Brakes	✔	
Handicap Lifts/Ramps	✔	
Instruments	✔	
Axles	✔	
Exhaust	✔	
Fuel System	✔	
OTHERS :		

1.2 SERVICING, PREVENTIVE MAINTENANCE, AND REPAIR AND MAINTENANCE DURING TESTING

1.2-I. TEST OBJECTIVE

The objective of this test is to collect maintenance data about the servicing, preventive maintenance, and repair.

1.2.-II. TEST DESCRIPTION

The test will be conducted by operating the NBM and collecting the following data on work order forms and a driver log.

1. Unscheduled Maintenance
   a. Bus number
   b. Date
   c. Mileage
   d. Description of malfunction
   e. Location of malfunction (e.g., in service or undergoing inspection)
   f. Repair action and parts used
   g. Man-hours required

2. Scheduled Maintenance
   a. Bus number
   b. Date
   c. Mileage
   d. Engine running time (if available)
   e. Results of scheduled inspections
   f. Description of malfunction (if any)
   g. Repair action and parts used (if any)
   h. Man-hours required

The buses will be operated in accelerated durability service. While typical items are given below, the specific service schedule will be that specified by the manufacturer.

A. Service
   1. Fueling
   2. Consumable checks
   3. Interior cleaning

B. Preventive Maintenance
   4. Brake adjustments
   5. Lubrication
   6. 3,000 mi (or equivalent) inspection

7. Oil and filter change inspection
8. Major inspection
9. Tune-up

C. Periodic Repairs
1. Brake reline
2. Transmission change
3. Engine change
4. Windshield wiper motor change
5. Stoplight bulb change
6. Towing operations
7. Hoisting operations

1.2-III. DISCUSSION

Servicing and preventive maintenance were performed at manufacturer-specified intervals. The following Scheduled Maintenance Form lists the mileage, items serviced, the service interval, and amount of time required to perform the maintenance. Table 1 is a list of the lubricating products used in servicing. Finally, the Unscheduled Maintenance List along with Unscheduled Maintenance-related photographs is included in Section 5.7, Structural Durability. This list supplies information related to failures that occurred during the durability portion of testing. The Unscheduled Maintenance List includes the date and mileage at which the malfunction occurred, a description of the malfunction and repair, and the time required to perform the repair.

(Page 1 of 1)

SCHEDULED MAINTENANCE

Coach and Equipment 0514

DATE	TEST MILES	SERVICE	ACTIVITY	DOWN TIME	HOURS
09-09-05	1,443	P.M. / Inspection	Linkage, tie rods, universals/u-joints all lubed; all fluids checked.	4.00	4.00
09-22-05	2,381	P.M. / Inspection	Linkage, tie rods, universals/u-joints all lubed; all fluids checked.	4.00	4.00
10-10-05	3,159	P.M. / Inspection	Linkage, tie rods, universals/u-joints all lubed; all fluids checked.	4.00	4.00
10-13-05	4,097	P.M. / Inspection	Linkage, tie rods, universals/u-joints all lubed; all fluids checked.	4.00	4.00
10-20-05	5,205	P.M. / Inspection	Linkage, tie rods, universals/u-joints all lubed; all fluids checked.	4.00	4.00
10-28-05	6,276	P.M. / Inspection Fuel Economy Prep	Linkage, tie rods, universals/u-joints all lubed. Oil changed. Oil, fuel, and air filters changed. Transmission oil and filter changed.	8.00	8.00
11-04-05	7,500	P.M. / Inspection	Linkage, tie rods, universals/u-joints all lubed; all fluids checked.	4.00	4.00

CONTRACT NO. 071B9200172

Table 1. STANDARD LUBRICANTS

The following is a list of Texaco lubricant products used in bus testing conducted by the Penn State University Altoona Bus Testing Center:

ITEM	PRODUCT CODE	TEXACO DESCRIPTION
Engine oil	#2112	URSA Super Plus SAE 30
Transmission oil	#1866	Automatic Trans Fluid Mercon/Dexron II Multipurpose
Gear oil	#2316	Multigear Lubricant EP SAE 80W90
Wheel bearing & Chassis grease	#1935	Starplex II

1.3 REPLACEMENT AND/OR REPAIR OF SELECTED SUBSYSTEMS

1.3-I. TEST OBJECTIVE

The objective of this test is to establish the time required to replace and/or repair selected subsystems.

1.3-II. TEST DESCRIPTION

The test will involve components that may be expected to fail or require replacement during the service life of the bus. In addition, any component that fails during the NBM testing is added to this list. Components to be included are:

1. Transmission
2. Alternator
3. Starter
4. Batteries
5. Windshield wiper motor

1.3-III. DISCUSSION

During the test, several additional components were removed for repair or replacement. Following is a list of components and total repair/replacement time.

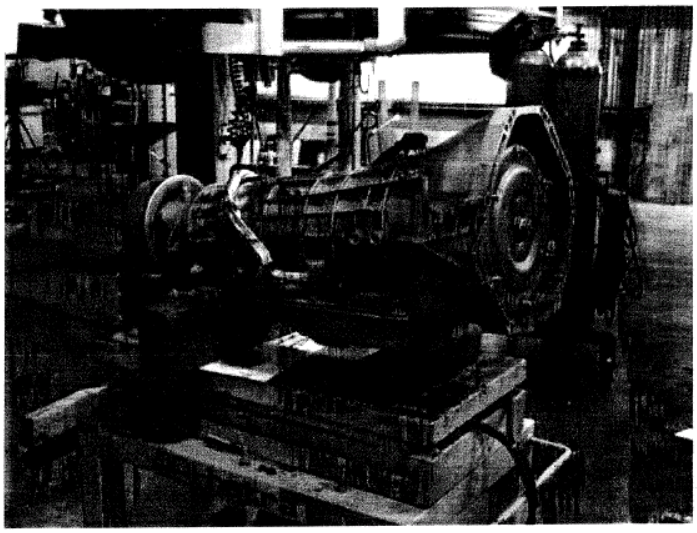
	MAN HOURS
Transmission solenoid.	3.00
All four rear spring bushings.	3.50
Left rear spring beam center bolt.	2.00

At the end of the test, the remaining items on the list were removed and replaced. The transmission assembly took 6.00 man-hours (two men 3.00 hrs) to remove and replace. The time required for repair/replacement of the four remaining components is given on the following Repair and/or Replacement Form.

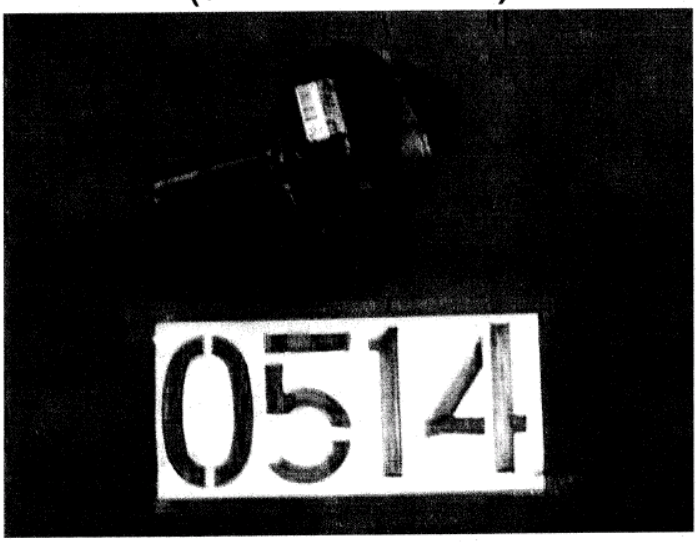
REPLACEMENT AND/OR REPAIR FORM

Subsystem	Replacement Time
Transmission	6.00 man hours
Wiper Motor	0.50 man hours
Starter	1.00 man hours
Alternator	1.50 man hours
Batteries	0.75 man hours

1.3 REPLACEMENT AND/OR REPAIR OF SELECTED SUBSYSTEMS

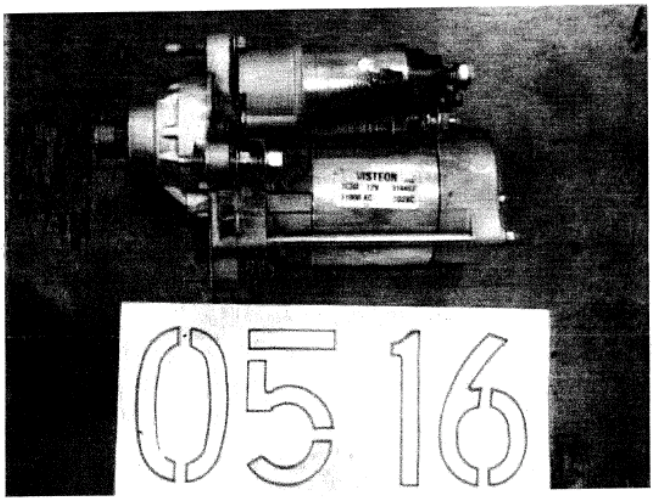


TRANSMISSION REMOVAL AND REPLACEMENT
(6.00 MAN HOURS)

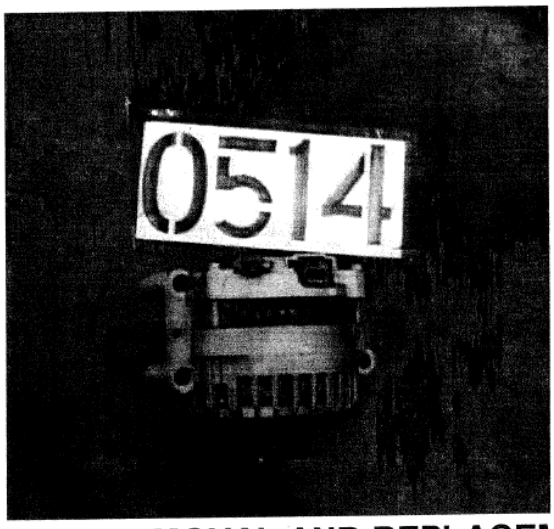


WIPER MOTOR REMOVAL AND REPLACEMENT
(0.50 MAN HOURS)

1.3 REPLACEMENT AND/OR REPAIR OF SELECTED SUBSYSTEMS CONT.



STARTER REMOVAL AND REPLACEMENT
(1.00 MAN HOURS)



ALTERNATOR REMOVAL AND REPLACEMENT
(1.50 MAN HOURS)

2. RELIABILITY - DOCUMENTATION OF BREAKDOWN AND REPAIR TIMES DURING TESTING

2-I. TEST OBJECTIVE

The objective of this test is to document unscheduled breakdowns, repairs, down time, and repair time that occur during testing.

2-II. TEST DESCRIPTION

Using the driver log and unscheduled work order forms, all significant breakdowns, repairs, man-hours to repair, and hours out of service are recorded on the Reliability Data Form.

CLASS OF FAILURES

Classes of failures are described below:

(a) Class 1: Physical Safety. A failure that could lead directly to passenger or driver injury and represents a severe crash situation.

(b) Class 2: Road Call. A failure resulting in an en route interruption of revenue service. Service is discontinued until the bus is replaced or repaired at the point of failure.

(c) Class 3: Bus Change. A failure that requires removal of the bus from service during its assignments. The bus is operable to a rendezvous point with a replacement bus.

(d) Class 4: Bad Order. A failure that does not require removal of the bus from service during its assignments but does degrade coach operation. The failure shall be reported by driver, inspector, or hostler.

2-III. DISCUSSION

A listing of breakdowns and unscheduled repairs is accumulated during the Structural Durability Test. The following Reliability Data Form lists all unscheduled repairs under classes as defined above. These classifications are somewhat subjective as the test is performed on a test track with careful inspections every two hours. However, even on the road, there is considerable latitude on deciding how to handle many failures.

The Unscheduled Repair List is also attached to provide a reference for the repairs that are included in the Reliability Data Forms.

The classification of repairs according to subsystem is intended to emphasize those systems which had persistent minor or more serious problems. There were no Class 1, 2 or 4 failures. Of the seven Class 3 failures, five involved the suspension system and two occurred with the engine/transmission. These are available for review in the Unscheduled Maintenance List, located in Section 5.7 Structural Durability.

RELIABILITY DATA FORMS

Bus Number: 0514	Date: 11-04-05
Personnel: Bob Reifsteck	

Failure Type			
Class 4 Bad Order	Class 3 Bus Change	Class 2 Road Call	Class 1 Physical Safety

Subsystems	Mileage	Mileage	Mileage	Mileage	Man Hours	Down Time
Engine/Transmission		1,443			3.00	80.00
		5,175			0.50	4.00
Suspension		2,381			3.50	48.00
		2,381			1.00	6.00
		2,640			2.00	5.00
		3,159			0.50	16.00
		5,683			1.50	4.00

3. SAFETY - A DOUBLE-LANE CHANGE (OBSTACLE AVOIDANCE)

3-I. TEST OBJECTIVE

The objective of this test is to determine handling and stability of the bus by measuring speed through a double lane change test.

3-II. TEST DESCRIPTION

The Safety Test is a vehicle handling and stability test. The bus will be operated at SLW on a smooth and level test track. The bus will be driven through a double lane change course at increasing speed until the test is considered unsafe or a speed of 45 mph is reached. The lane change course will be set up using pylons to mark off two 12 foot center to center lanes with two 100 foot lane change areas 100 feet apart. The bus will begin in one lane, change to the other lane in a 100 foot span, travel 100 feet, and return to the original lane in another 100 foot span. This procedure will be repeated, starting first in the right-hand and then in the left-hand lane.

3-III. DISCUSSION

The double-lane change was performed in both right-hand and left-hand directions. The bus was able to safely negotiate the test course in both the right-hand and left-hand directions up to the maximum test speed of 45 mph.

SAFETY DATA FORM

Bus Number: 0514	Date: 11-2-05
Personnel: B.S. & S.C.	

Temperature (°F): 46	Humidity (%): 56
Wind Direction: SW	Wind Speed (mph): 5
Barometric Pressure (in.Hg): 30.09	

SAFETY TEST: DOUBLE LANE CHANGE	
Maximum safe speed tested for double-lane change to left	45 mph
Maximum safe speed tested for double-lane change to right	45 mph
Comments of the position of the bus during the lane change: A safe profile was maintained through all portions of testing.	
Comments of the tire/ground contact patch: Tire/ground contact was maintained through all portions of testing.	

3. SAFETY

RIGHT - HAND APPROACH

LEFT - HAND APPROACH

4. PERFORMANCE - AN ACCELERATION, GRADEABILITY, AND TOP SPEED TEST

4-I. TEST OBJECTIVE

The objective of this test is to determine the acceleration, gradeability, and top speed capabilities of the bus.

4-II. TEST DESCRIPTION

In this test, the bus will be operated at SLW on the skid pad at the PSBRTF. The bus will be accelerated at full throttle from a standstill to a maximum "geared" or "safe" speed as determined by the test driver. The vehicle speed is measured using a Correvit non-contacting speed sensor. The times to reach speed between ten mile per hour increments are measured and recorded using a stopwatch with a lap timer. The time to speed data will be recorded on the Performance Data Form and later used to generate a speed vs. time plot and gradeability calculations.

4-III. DISCUSSION

This test consists of three runs in both the clockwise and counterclockwise directions on the Test Track. Velocity versus time data is obtained for each run and results are averaged together to minimize any test variability which might be introduced by wind or other external factors. The test was performed up to a maximum speed of 50 mph. The fitted curve of velocity vs. time is attached, followed by the calculated gradeability results. The average time to obtain 50 mph was 16.39 seconds.

PERFORMANCE DATA FORM

Bus Number: 0514	Date: 11-2-05
Personnel: B.S., S.C. & G.M.	
Temperature (°F): 46	Humidity (%): 56
Wind Direction: SW	Wind Speed (mph): 5
Barometric Pressure (in.Hg): 30.09	
Air Conditioning compressor-OFF	✔ Checked
Ventilation fans-ON HIGH	✔ Checked
Heater pump motor-Off	✔ Checked
Defroster-OFF	✔ Checked
Exterior and interior lights-ON	✔ Checked
Windows and doors-CLOSED	✔ Checked

ACCELERATION, GRADEABILITY, TOP SPEED

Counter Clockwise Recorded Interval Times

Speed	Run 1	Run 2	Run 3
10 mph	3.53	3.18	3.24
20 mph	4.79	5.09	4.93
30 mph	7.45	7.36	7.43
40 mph	11.61	11.27	11.27
Top Test Speed(mph) 50	17.08	16.64	17.05

Clockwise Recorded Interval Times

Speed	Run 1	Run 2	Run 3
10 mph	3.42	3.09	2.89
20 mph	4.84	4.74	4.52
30 mph	7.09	6.96	6.82
40 mph	10.93	10.65	10.36
Top Test Speed(mph) 50	16.01	15.68	15.89

0514.ACC

PERFORMANCE SUMMARY SHEET

BUS MANUFACTURER :Coach & Equipment
BUS MODEL :Phoenix

BUS NUMBER :0514
TEST DATE :11/2/05

TEST CONDITIONS :

TEMPERATURE (DEG F) : 46.0
WIND DIRECTION : SW
WIND SPEED (MPH) : 5.0
HUMIDITY (%) : 56
BAROMETRIC PRESSURE (IN. HG) : 30.1

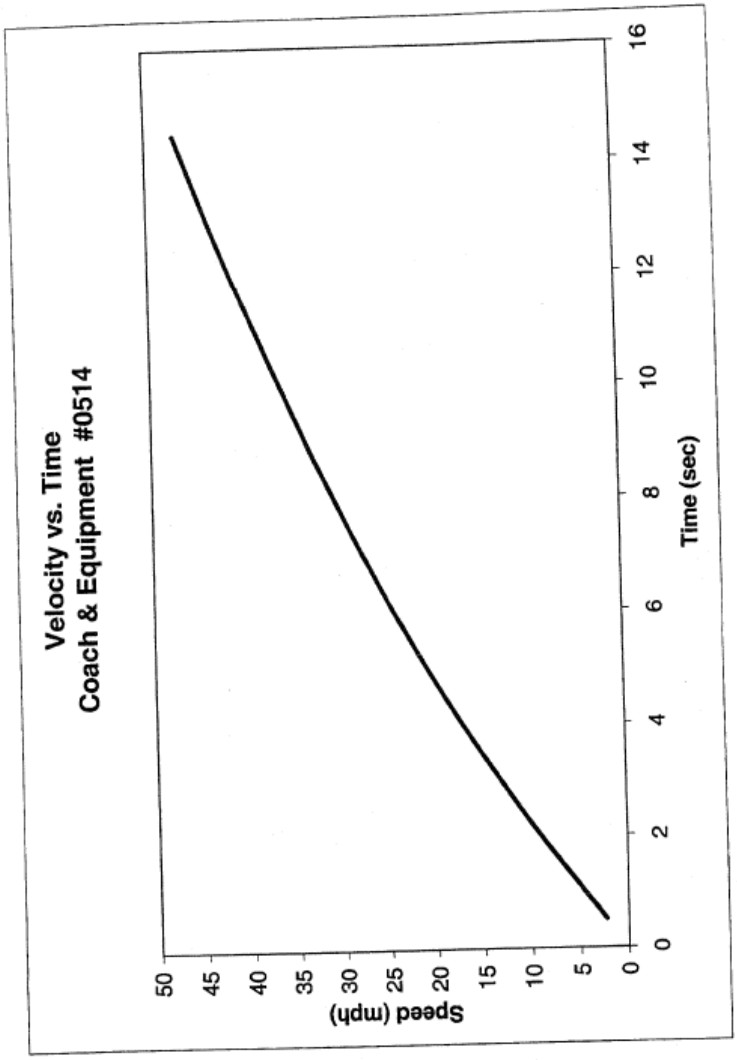
VEHICLE SPEED (MPH)	AVERAGE TIME (SEC) CCW DIRECTION	CW DIRECTION	TOTAL
10.0	3.32	3.13	3.23
20.0	4.94	4.70	4.82
30.0	7.41	6.96	7.19
40.0	11.38	10.65	11.02
50.0	16.92	15.86	16.39

TEST SUMMARY :

VEHICLE SPEED (MPH)	TIME (SEC)	ACCELERATION (FT/SEC^2)	MAX. GRADE (%)
1.0	.21	6.9	22.0
5.0	1.08	6.6	20.8
10.0	2.24	6.1	19.4
15.0	3.48	5.7	18.0
20.0	4.82	5.3	16.6
25.0	6.27	4.8	15.2
30.0	7.85	4.4	13.9
35.0	9.58	4.0	12.7
40.0	11.49	3.7	11.4
45.0	13.60	3.3	10.3
50.0	15.95	2.9	9.2

NOTE : Gradeability results were calculated from performance test data. Actual sustained gradeability performance for vehicles equipped with auto transmission may be lower than the values indicated here.

Page 1


Velocity vs. Time
Coach & Equipment #0514
Speed (mph)
50
45
40
35
30
25
20
15
10
5
0
0
2
4
6
8
10
12
14
16
Time (sec)

5. STRUCTURAL INTEGRITY

5.1 STRUCTURAL STRENGTH AND DISTORTION TESTS - STRUCTURAL SHAKEDOWN TEST

5.1-I. DISCUSSION

The objective of this test is to determine certain static characteristics (e.g., bus floor deflection, permanent structural deformation, etc.) under static loading conditions.

5.1-II. TEST DESCRIPTION

In this test, the bus will be isolated from the suspension by blocking the vehicle under the suspension points. The bus will then be loaded and unloaded up to a maximum of three times with a distributed load equal to 2.5 times gross load. Gross load is 150 lb for every designed passenger seating position, for the driver, and for each 1.5 sq ft of free floor space. For a distributed load equal to 2.5 times gross load, place a 375-lb load on each seat and on every 1.5 sq ft of free floor space. The first loading and unloading sequence will "settle" the structure. Bus deflection will be measured at several locations during the loading sequences.

5.1-III. DISCUSSION

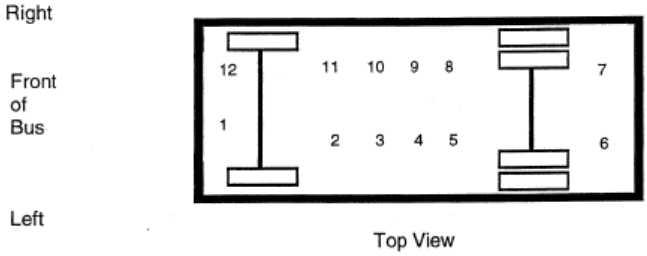
This test was performed based on a maximum passenger capacity of 27 people including the driver + 2 wheel chair positions. The resulting test load is (27 x 375 lb) = 10,125 lb + 1,200 lbs (2 wheel chair positions) = 11,325 lbs. The load is distributed evenly over the passenger space. Deflection data before and after each loading and unloading sequence is provided on the Structural Shakedown Data Form.

The unloaded height after each test becomes the original height for the next test. Some initial settling is expected due to undercoat compression, etc. After each loading cycle, the deflection of each reference point is determined. The bus is then unloaded and the residual (permanent) deflection is recorded. On the final test, the maximum loaded deflection was 0.144 inches at reference point 6. The maximum permanent deflection after the final loading sequence ranged from -.003 inches at reference points 8, 9, and 10 to 0.005 inches at reference point 6.

STRUCTURAL SHAKEDOWN DATA FORM

Bus Number: 0514	Date: 8-30-05
Personnel: T.S., E.L., D.L., S.C. & C.S.	Temperature (°F):
Loading Sequence: ■ 1 ☐ 2 ☐ 3 (check one) Test Load (lbs): 11,325	

Indicate Approximate Location of Each Reference Point



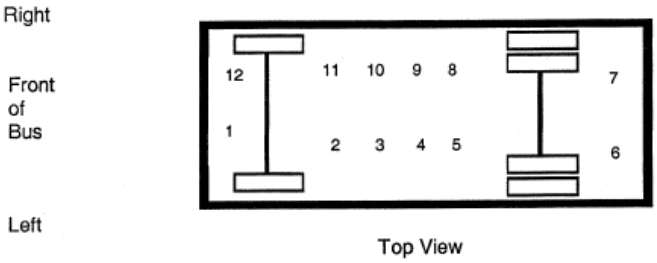
Top View

Reference Point No.	A (in) Original Height	B (in) Loaded Height	B-A (in) Loaded Deflection	C (in) Unloaded Height	C-A (in) Permanent Deflection
1	0	.042	.042	.012	.012
2	0	.053	.053	.011	.011
3	0	.095	.095	.011	.011
4	0	.107	.107	.019	.019
5	0	.072	.072	.008	.008
6	0	.156	.156	.006	.006
7	0	.099	.099	.009	.009
8	0	.081	.081	.012	.012
9	0	.092	.092	.014	.014
10	0	.084	.084	.014	.014
11	0	.050	.050	.011	.011
12	0	.090	.090	.011	.011

STRUCTURAL SHAKEDOWN DATA FORM

Bus Number: 0514	Date: 8-30-05
Personnel: T.S., E.L., D.L., S.C. & C.S.	Temperature (°F):
Loading Sequence: ☐ 1 ■ 2 ☐ 3 (check one) Test Load (lbs): 11,325	

Indicate Approximate Location of Each Reference Point



Reference Point No.	A (in) Original Height	B (in) Loaded Height	B-A (in) Loaded Deflection	C (in) Unloaded Height	C-A (in) Permanent Deflection
1	.012	.046	.034	.014	.002
2	.011	.055	.044	.010	-.001
3	.011	.097	.086	.009	-.002
4	.019	.116	.097	.022	.003
5	.008	.077	.069	.008	.000
6	.006	.150	.144	.011	.005
7	.009	.131	.122	.011	.002
8	.012	.085	.073	.009	-.003
9	.014	.098	.084	.011	-.003
10	.014	.088	.074	.011	-.003
11	.011	.053	.042	.009	-.002
12	.011	.092	.081	.011	.000

5.1 STRUCTURAL SHAKEDOWN TEST

TEST BUS LOADED TO 2.5 TIMES GVL
(11,325 LBS)

5.2 STRUCTURAL STRENGTH AND DISTORTION TESTS - STRUCTURAL DISTORTION

5.2-I. TEST OBJECTIVE

The objective of this test is to observe the operation of the bus subsystems when the bus is placed in a longitudinal twist simulating operation over a curb or through a pothole.

5.2-II. TEST DESCRIPTION

With the bus loaded to GVWR, each wheel of the bus will be raised (one at a time) to simulate operation over a curb and the following will be inspected:

1. Body
2. Windows
3. Doors
4. Roof vents
5. Special seating
6. Undercarriage
7. Engine
8. Service doors
9. Escape hatches
10. Steering mechanism

Each wheel will then be lowered (one at a time) to simulate operation through a pothole and the same items inspected.

5.2-III. DISCUSSION

The test sequence was repeated ten times. The first and last test is with all wheels level. The other eight tests are with each wheel 6 inches higher and 6 inches lower than the other three wheels.

All doors, windows, escape mechanisms, engine, steering and handicapped devices operated normally throughout the test. The undercarriage and body indicated no deficiencies. Water leakage was observed during the test at the left side emergency window frame and the frame of the roof hatch. The results of this test are indicated on the following data forms.

DISTORTION TEST INSPECTION FORM
(Note: Ten copies of this data sheet are required)

Bus Number: 0514	Date: 8-31-05
Personnel: T.S., D.L., E.L. & S.C.	Temperature(°F): 74

Wheel Position : (check one)		
All wheels level	■ before	□ after
Left front	□ 6 in higher	□ 6 in lower
Right front	□ 6 in higher	□ 6 in lower
Right rear	□ 6 in higher	□ 6 in lower
Left rear	□ 6 in higher	□ 6 in lower
Right center	□ 6 in higher	□ 6 in lower
Left center	□ 6 in higher	□ 6 in lower

	Comments
■ Windows	No deficiencies.
■ Front Doors	No deficiencies.
■ Rear Doors	No deficiencies.
■ Escape Mechanisms/ Roof Vents	No deficiencies.
■ Engine	No deficiencies.
■ Handicapped Device/ Special Seating	No deficiencies.
■ Undercarriage	No deficiencies.
■ Service Doors	No deficiencies.
■ Body	No deficiencies.
■ Windows/ Body Leakage	No deficiencies.
■ Steering Mechanism	No deficiencies.

DISTORTION TEST INSPECTION FORM
(Note: Ten copies of this data sheet are required)

Bus Number: 0514	Date: 8-31-05
Personnel: T.S., D.L., E.L. & S.C.	Temperature(°F): 74

Wheel Position : (check one)		
All wheels level	☐ before	☐ after
Left front	■ 6 in higher	☐ 6 in lower
Right front	☐ 6 in higher	☐ 6 in lower
Right rear	☐ 6 in higher	☐ 6 in lower
Left rear	☐ 6 in higher	☐ 6 in lower
Right center	☐ 6 in higher	☐ 6 in lower
Left center	☐ 6 in higher	☐ 6 in lower

	Comments
■ Windows	No deficiencies.
■ Front Doors	No deficiencies.
■ Rear Doors	No deficiencies.
■ Escape Mechanisms/ Roof Vents	No deficiencies.
■ Engine	No deficiencies.
■ Handicapped Device/ Special Seating	No deficiencies.
■ Undercarriage	No deficiencies.
■ Service Doors	No deficiencies.
■ Body	No deficiencies.
■ Windows/ Body Leakage	No deficiencies.
■ Steering Mechanism	No deficiencies.

DISTORTION TEST INSPECTION FORM
(Note: Ten copies of this data sheet are required)

Bus Number: 0514	Date: 8-31-05
Personnel: T.S., D.L., E.L. & S.C.	Temperature(°F): 74

Wheel Position : (check one)		
All wheels level	☐ before	☐ after
Left front	☐ 6 in higher	☐ 6 in lower
Right front	■ 6 in higher	☐ 6 in lower
Right rear	☐ 6 in higher	☐ 6 in lower
Left rear	☐ 6 in higher	☐ 6 in lower
Right center	☐ 6 in higher	☐ 6 in lower
Left center	☐ 6 in higher	☐ 6 in lower

	Comments
■ Windows	No deficiencies.
■ Front Doors	No deficiencies.
■ Rear Doors	No deficiencies.
■ Escape Mechanisms/ Roof Vents	Slight leak around the frame of the roof hatch.
■ Engine	No deficiencies.
■ Handicapped Device/ Special Seating	No deficiencies.
■ Undercarriage	No deficiencies.
■ Service Doors	No deficiencies.
■ Body	No deficiencies.
■ Windows/ Body Leakage	No deficiencies.
■ Steering Mechanism	No deficiencies.

DISTORTION TEST INSPECTION FORM
(Note: Ten copies of this data sheet are required)

Bus Number: 0514	Date: 8-31-05
Personnel: T.S., D.L., E.L. & S.C.	Temperature(°F): 74

Wheel Position : (check one)		
All wheels level	☐ before	☐ after
Left front	☐ 6 in higher	☐ 6 in lower
Right front	☐ 6 in higher	☐ 6 in lower
Right rear	■ 6 in higher	☐ 6 in lower
Left rear	☐ 6 in higher	☐ 6 in lower
Right center	☐ 6 in higher	☐ 6 in lower
Left center	☐ 6 in higher	☐ 6 in lower

	Comments
■ Windows	No deficiencies.
■ Front Doors	No deficiencies.
■ Rear Doors	No deficiencies.
■ Escape Mechanisms/ Roof Vents	Slight leak around the frame of the roof hatch.
■ Engine	No deficiencies.
■ Handicapped Device/ Special Seating	No deficiencies.
■ Undercarriage	No deficiencies.
■ Service Doors	No deficiencies.
■ Body	No deficiencies.
■ Windows/ Body Leakage	No deficiencies.
■ Steering Mechanism	No deficiencies.

DISTORTION TEST INSPECTION FORM
(Note: Ten copies of this data sheet are required)

Bus Number: 0514	Date: 8-31-05
Personnel: T.S., D.L., E.L. & S.C.	Temperature(°F): 74

Wheel Position : (check one)		
All wheels level	☐ before	☐ after
Left front	☐ 6 in higher	☐ 6 in lower
Right front	☐ 6 in higher	☐ 6 in lower
Right rear	☐ 6 in higher	☐ 6 in lower
Left rear	■ 6 in higher	☐ 6 in lower
Right center	☐ 6 in higher	☐ 6 in lower
Left center	☐ 6 in higher	☐ 6 in lower

	Comments
■ Windows	No deficiencies.
■ Front Doors	No deficiencies.
■ Rear Doors	No deficiencies.
■ Escape Mechanisms/ Roof Vents	Slight leak around the frame of the roof hatch.
■ Engine	No deficiencies.
■ Handicapped Device/ Special Seating	No deficiencies.
■ Undercarriage	No deficiencies.
■ Service Doors	No deficiencies.
■ Body	No deficiencies.
■ Windows/ Body Leakage	No deficiencies.
■ Steering Mechanism	No deficiencies.

DISTORTION TEST INSPECTION FORM
(Note: Ten copies of this data sheet are required)

Bus Number: 0514	Date: 8-31-05
Personnel: T.S., D.L., E.L. & S.C.	Temperature(°F): 74

Wheel Position : (check one)		
All wheels level	☐ before	☐ after
Left front	☐ 6 in higher	☐ 6 in lower
Right front	☐ 6 in higher	☐ 6 in lower
Right rear	☐ 6 in higher	☐ 6 in lower
Left rear	☐ 6 in higher	■ 6 in lower
Right center	☐ 6 in higher	☐ 6 in lower
Left center	☐ 6 in higher	☐ 6 in lower

	Comments
■ Windows	No deficiencies.
■ Front Doors	No deficiencies.
■ Rear Doors	No deficiencies.
■ Escape Mechanisms/ Roof Vents	Slight leak around the frame of the roof hatch.
■ Engine	No deficiencies.
■ Handicapped Device/ Special Seating	No deficiencies.
■ Undercarriage	No deficiencies.
■ Service Doors	No deficiencies.
■ Body	No deficiencies.
■ Windows/ Body Leakage	Slight leak around the frame of the emergency window.
■ Steering Mechanism	No deficiencies.

DISTORTION TEST INSPECTION FORM
(Note: Ten copies of this data sheet are required)

Bus Number: 0514	Date: 8-31-05
Personnel: T.S., D.L., E.L. & S.C.	Temperature(°F): 74

Wheel Position : (check one)		
All wheels level	☐ before	☐ after
Left front	☐ 6 in higher	☐ 6 in lower
Right front	☐ 6 in higher	☐ 6 in lower
Right rear	☐ 6 in higher	■ 6 in lower
Left rear	☐ 6 in higher	☐ 6 in lower
Right center	☐ 6 in higher	☐ 6 in lower
Left center	☐ 6 in higher	☐ 6 in lower

	Comments
■ Windows	No deficiencies.
■ Front Doors	No deficiencies.
■ Rear Doors	No deficiencies.
■ Escape Mechanisms/ Roof Vents	Slight leak around the frame of the roof hatch.
■ Engine	No deficiencies.
■ Handicapped Device/ Special Seating	No deficiencies.
■ Undercarriage	No deficiencies.
■ Service Doors	No deficiencies.
■ Body	No deficiencies.
■ Windows/ Body Leakage	Slight leak around the frame of the emergency window.
■ Steering Mechanism	No deficiencies.

DISTORTION TEST INSPECTION FORM
(Note: Ten copies of this data sheet are required)

Bus Number: 0514	Date: 8-31-05
Personnel: T.S., D.L., E.L. & S.C.	Temperature(°F): 74

Wheel Position : (check one)		
All wheels level	☐ before	☐ after
Left front	☐ 6 in higher	☐ 6 in lower
Right front	☐ 6 in higher	■ 6 in lower
Right rear	☐ 6 in higher	☐ 6 in lower
Left rear	☐ 6 in higher	☐ 6 in lower
Right center	☐ 6 in higher	☐ 6 in lower
Left center	☐ 6 in higher	☐ 6 in lower

	Comments
■ Windows	No deficiencies.
■ Front Doors	No deficiencies.
■ Rear Doors	No deficiencies.
■ Escape Mechanisms/ Roof Vents	Slight leak around the frame of the roof hatch.
■ Engine	No deficiencies.
■ Handicapped Device/ Special Seating	No deficiencies.
■ Undercarriage	No deficiencies.
■ Service Doors	No deficiencies.
■ Body	No deficiencies.
■ Windows/ Body Leakage	No deficiencies.
■ Steering Mechanism	Slight leak around the frame of the emergency window.

DISTORTION TEST INSPECTION FORM
(Note: Ten copies of this data sheet are required)

Bus Number: 0514	Date: 8-31-05
Personnel: T.S., D.L., E.L. & S.C.	Temperature(°F): 74

Wheel Position : (check one)		
All wheels level	☐ before	☐ after
Left front	☐ 6 in higher	■ 6 in lower
Right front	☐ 6 in higher	☐ 6 in lower
Right rear	☐ 6 in higher	☐ 6 in lower
Left rear	☐ 6 in higher	☐ 6 in lower
Right center	☐ 6 in higher	☐ 6 in lower
Left center	☐ 6 in higher	☐ 6 in lower

	Comments
■ Windows	No deficiencies.
■ Front Doors	No deficiencies.
■ Rear Doors	No deficiencies.
■ Escape Mechanisms/ Roof Vents	Slight leak around the frame of the roof hatch.
■ Engine	No deficiencies.
■ Handicapped Device/ Special Seating	No deficiencies.
■ Undercarriage	No deficiencies.
■ Service Doors	No deficiencies.
■ Body	No deficiencies.
■ Windows/ Body Leakage	No deficiencies.
■ Steering Mechanism	No deficiencies.

DISTORTION TEST INSPECTION FORM
(Note: Ten copies of this data sheet are required)

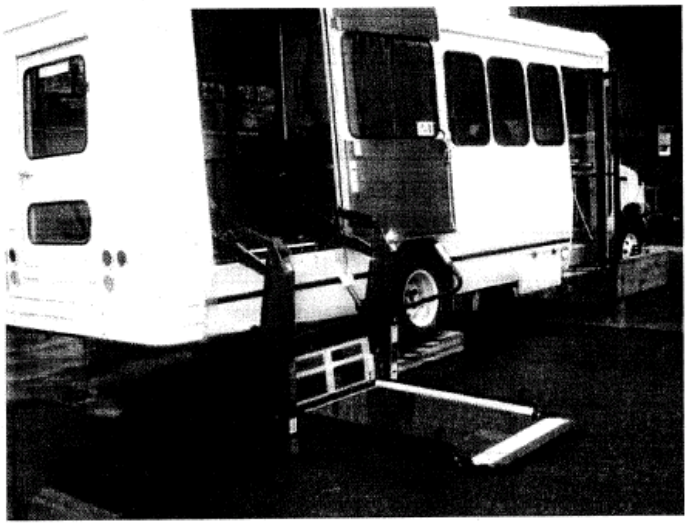
Bus Number: 0514	Date: 8-31-05
Personnel: T.S., D.L., E.L. & S.C.	Temperature(°F): 74

Wheel Position : (check one)		
All wheels level	☐ before	■ after
Left front	☐ 6 in higher	☐ 6 in lower
Right front	☐ 6 in higher	☐ 6 in lower
Right rear	☐ 6 in higher	☐ 6 in lower
Left rear	☐ 6 in higher	☐ 6 in lower
Right center	☐ 6 in higher	☐ 6 in lower
Left center	☐ 6 in higher	☐ 6 in lower

	Comments
■ Windows	No deficiencies.
■ Front Doors	No deficiencies.
■ Rear Doors	No deficiencies.
■ Escape Mechanisms/ Roof Vents	Slight leak around the frame of the roof hatch.
■ Engine	No deficiencies.
■ Handicapped Device/ Special Seating	No deficiencies.
■ Undercarriage	No deficiencies
■ Service Doors	No deficiencies.
■ Body	No deficiencies.
■ Windows/ Body Leakage	No deficiencies.
■ Steering Mechanism	Slight leak around the frame of the emergency window.

5.2 STRUCTURAL DISTORTION TEST

LEFT FRONT WHEEL SIX INCHES HIGHER



RIGHT REAR WHEEL SIX INCHES HIGHER

5.3 STRUCTURAL STRENGTH AND DISTORTION TESTS - STATIC TOWING TEST

5.3-I. TEST OBJECTIVE

The objective of this test is to determine the characteristics of the bus towing mechanisms under static loading conditions.

5.3-II. TEST DESCRIPTION

Utilizing a load-distributing yoke, a hydraulic cylinder is used to apply a static tension load equal to 1.2 times the bus curb weight. The load will be applied to both the front and rear, if applicable, towing fixtures at an angle of 20 degrees with the longitudinal axis of the bus, first to one side then the other in the horizontal plane, and then upward and downward in the vertical plane. Any permanent deformation or damage to the tow eyes or adjoining structure will be recorded.

5.3-III. DISCUSSION

The bus submitted for testing was not equipped with any type of tow eyes or tow hooks, therefore, the Static Towing Test was not performed.

5.4 STRUCTURAL STRENGTH AND DISTORTION TESTS - DYNAMIC TOWING TEST

5.4-I. TEST OBJECTIVE

The objective of this test is to verify the integrity of the towing fixtures and determine the feasibility of towing the bus under manufacturer specified procedures.

5.4-II. TEST DESCRIPTION

This test requires the bus be towed at curb weight using the specified equipment and instructions provided by the manufacturer and a heavy-duty wrecker. The bus will be towed for 5 miles at a speed of 20 mph for each recommended towing configuration. After releasing the bus from the wrecker, the bus will be visually inspected for any structural damage or permanent deformation. All doors, windows and passenger escape mechanisms will be inspected for proper operation.

5.4-III. DISCUSSION

The bus was towed using a heavy-duty wrecker. The towing interface was accomplished by incorporating a hydraulic under lift. A front lift tow was performed. Rear towing is not recommended. No problems, deformation, or damage was noted during testing.

DYNAMIC TOWING TEST DATA FORM

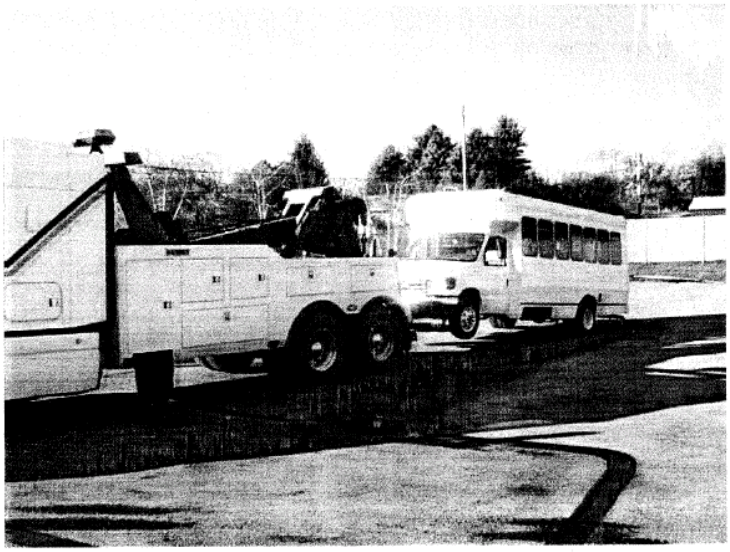
Bus Number: 0514	Date: 11/11/05
Personnel: E.L. & D.L.	

Temperature (°F): 40	Humidity (%): 70
Wind Direction: SSW	Wind Speed (mph): Variable @ 3 - 5
Barometric Pressure (in.Hg): 30.05	

Inspect tow equipment-bus interface.
Comments: A safe and adequate connection was made between the tow equipment and the bus.
Inspect tow equipment-wrecker interface.
Comments: A safe and adequate connection was made between the tow equipment and the wrecker.
Towing Comments: A front life tow was performed incorporating a hydraulic under lift wrecker. No problems were encountered with the towing interface.
Description and location of any structural damage: No damage or deformation was observed.
General Comments: A safe and adequate tow interface was accomplished. No damage or deformation was observed and no problems with the towing interface were encountered.

5.4 DYNAMIC TOWING TEST

TOWING INTERFACE



TEST BUS IN TOW

5.5 STRUCTURAL STRENGTH AND DISTORTION TESTS – JACKING TEST

5.5-I. TEST OBJECTIVE

The objective of this test is to inspect for damage due to the deflated tire, and determine the feasibility of jacking the bus with a portable hydraulic jack to a height sufficient to replace a deflated tire.

5.5-II. TEST DESCRIPTION

With the bus at curb weight, the tire(s) at one corner of the bus are replaced with deflated tire(s) of the appropriate type. A portable hydraulic floor jack is then positioned in a manner and location specified by the manufacturer and used to raise the bus to a height sufficient to provide 3-in clearance between the floor and an inflated tire. The deflated tire(s) are replaced with the original tire(s) and the hack is lowered. Any structural damage or permanent deformation is recorded on the test data sheet. This procedure is repeated for each corner of the bus.

5.5-III. DISCUSSION

The jack used for this test has a minimum height of 8.75 inches. During the deflated portion of the test, the jacking point clearances ranged from 8.1 inches to 19.0 inches. No deformation or damage was observed during testing. A complete listing of jacking point clearances is provided in the Jacking Test Data Form.

JACKING CLEARANCE SUMMARY

Condition	Frame Point Clearance
Front axle – one tire flat	13.8"
Rear axle – one tire flat	18.6"
Rear axle – two tires flat	16.9"

JACKING TEST DATA FORM

Bus Number: 0514	Date: 8-22-05
Personnel: T.S. & S.C.	Temperature (°F): 75

Record any permanent deformation or damage to bus as well as any difficulty encountered during jacking procedure.

Deflated Tire	Jacking Pad Clearance Body/Frame (in)	Jacking Pad Clearance Axle/Suspension (in)	Comments
Right front	15.5 " I 13.8 " D	10.8 " I 8.1 " D	None noted.
Left front	15.9 " I 14.0 " D	11.0 " I 8.3 " D	None noted.
Right rear—outside	19.3 " I 18.6 " D	11.6 " I 10.9 " D	None noted.
Right rear—both	19.3 " I 16.9 " D	11.6 " I 9.0 " D	None noted.
Left rear—outside	19.6 " I 19.0 " D	11.6 " I 11.0 " D	None noted.
Left rear—both	19.6 " I 17.0 " D	11.6 " I 9.1 " D	None noted.
Right middle or tag—outside	NA	NA	
Right middle or tag—both	NA	NA	
Left middle or tag—outside	NA	NA	
Left middle or tag—both	NA	NA	

Additional comments of any deformation or difficulty during jacking:

None noted.

5.6 STRUCTURAL STRENGTH AND DISTORTION TESTS - HOISTING TEST

5.6-I. TEST OBJECTIVE

The objective of this test is to determine possible damage or deformation caused by the jack/stands.

5.6-II. TEST DESCRIPTION

With the bus at curb weight, the front end of the bus is raised to a height sufficient to allow manufacturer-specified placement of jack stands under the axles or jacking pads independent of the hoist system. The bus will be checked for stability on the jack stands and for any damage to the jacking pads or bulkheads. The procedure is repeated for the rear end of the bus. The procedure is then repeated for the front and rear simultaneously.

5.6-III. DISCUSSION

The test was conducted using four posts of a six-post electric lift and standard 19 inch jack stands. The bus was hoisted from the front wheel, rear wheel, and then the front and rear wheels simultaneously and placed on jack stands.

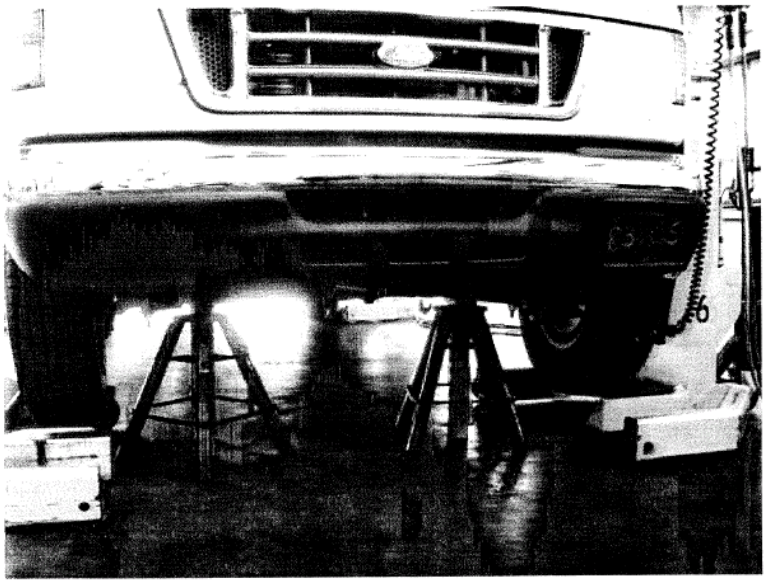
The bus easily accommodated the placement of the vehicle lifts and jack stands and the procedure was performed without any instability noted.

HOISTING TEST DATA FORM

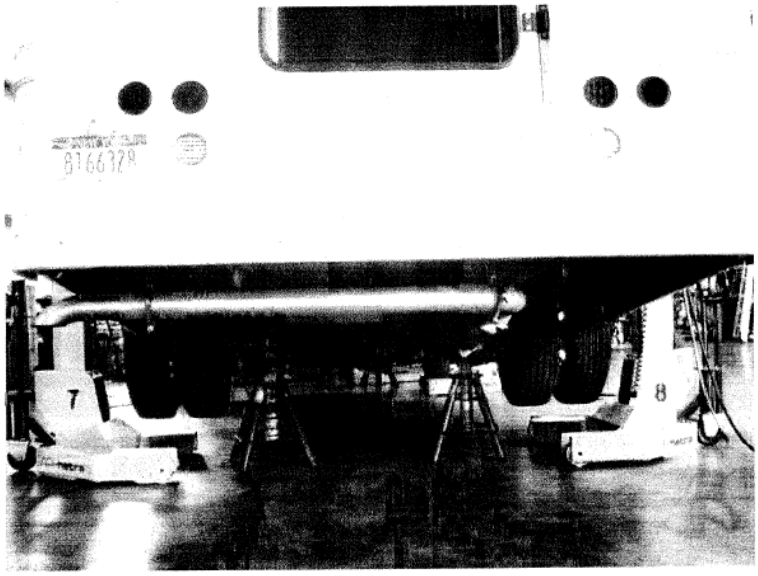
Bus Number: 0514	Date: 8-22-05
Personnel: T.S. & S.C.	Temperature (°F): 78

Comments of any structural damage to the jacking pads or axles while both the front wheels are supported by the jack stands:
None noted.
Comments of any structural damage to the jacking pads or axles while both the rear wheels are supported by the jack stands:
None noted.
Comments of any structural damage to the jacking pads or axles while both the front and rear wheels are supported by the jack stands:
None noted.

5.6 HOISTING TEST



TEST BUS STABLE ON JACK STANDS



5.7 STRUCTURAL DURABILITY TEST

5.7-I. TEST OBJECTIVE

The objective of this test is to perform an accelerated durability test that approximates up to 25 percent of the service life of the vehicle.

5.7-II. TEST DESCRIPTION

The test vehicle is driven a total of 7,500 miles; approximately 5,000 miles on the PSBRTF Durability Test Track and approximately 2,500 miscellaneous other miles. The test will be conducted with the bus operated under three different loading conditions. The first segment will consist of approximately 3,000 miles with the bus operated at GVW. The second segment will consist of approximately 1,500 miles with the bus operated at SLW. The remainder of the test, approximately 3,000 miles, will be conducted with the bus loaded to CW. If GVW exceeds the axle design weights, then the load will be adjusted to the axle design weights and the change will be recorded. All subsystems are run during these tests in their normal operating modes. All recommended manufacturers servicing is to be followed and noted on the vehicle maintainability log. Servicing items accelerated by the durability tests will be compressed by 10:1; all others will be done on a 1:1 mi/mi basis. Unscheduled breakdowns and repairs are recorded on the same log as are any unusual occurrences as noted by the driver. Once a week the test vehicle shall be washed down and thoroughly inspected for any signs of failure.

5.7-III. DISCUSSION

The Structural Durability Test was started on September 1, 2005 and was conducted until November 4, 2005. The first 3,000 miles were performed at a GVW of 13,410 lbs. The number of standing passengers was reduced from 12 to 0 plus the elimination of one wheelchair position. The ballast for all 12 standing passengers and one wheelchair position was eliminated. This reduction in passenger weight was necessary to avoid exceeding the GAWR (9,450 lbs) of the rear axle. The GVW segment was completed on September 22, 2005. The next 1,500 mile SLW segment was performed at the same 13,410 lbs. The ballast for one wheelchair position (600 lbs) was eliminated to avoid exceeding the GAWR (9,450 lbs) of the rear axle. The SLW segment was completed on October 11, 2005 and the final 3,000 mile segment was performed at a CW of 10,600 lbs and completed on November 4, 2005.

COACH & EQUIPMENT - TEST BUS #0514
MILEAGE DRIVEN/RECORDED FROM DRIVERS' LOGS

DATE	TOTAL DURABILITY TRACK	TOTAL OTHER MILES	TOTAL
08/29/05 TO 09/04/05	425.00	68.00	493.00
09/05/05 TO 09/11/05	860.00	90.00	950.00
09/12/05 TO 09/18/05	390.00	103.00	493.00
09/19/05 TO 09/25/05	325.00	120.00	445.00
09/26/05 TO 10/02/05	291.00	75.00	366.00
10/03/05 TO 10/09/05	394.00	18.00	412.00
10/10/05 TO 10/16/05	780.00	574.00	1354.00
10/17/05 TO 10/23/05	883.00	132.00	1015.00
10/24/05 TO 10/30/05	652.00	246.00	898.00
10/31/05 TO 11/06/05	0.00	1075.00	1075.00
TOTAL	5000.00	2501.00	7501.00

Table 4. Driving Schedule for Bus Operation on the Durability Test Track.

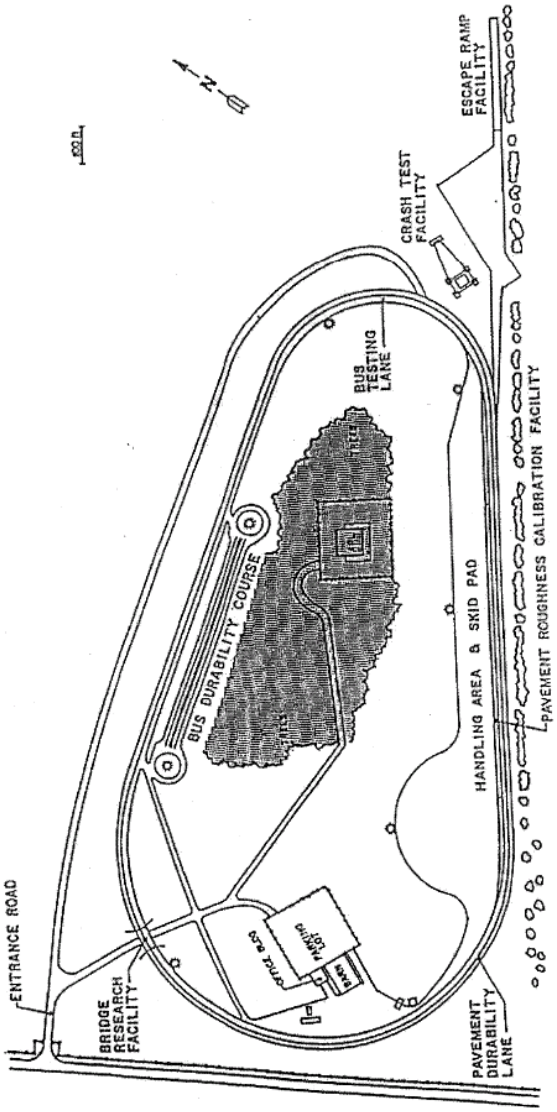
STANDARD OPERATING SCHEDULE

Monday through Friday

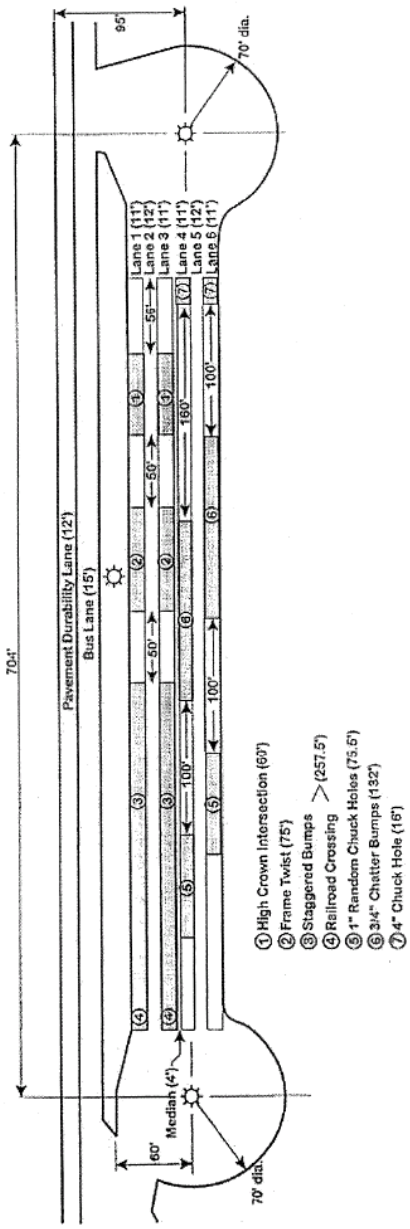
	HOUR	ACTION
Shift 1	midnight	D
	1:40 am	C
	1:50 am	B
	2:00 am	D
	3:35 am	C
	3:45 am	B
	4:05 am	D
	5:40 am	C
	5:50 am	B
	6:00 am	D
	7:40 am	C
	7:50 am	F
Shift 2	8:00 am	D
	9:40 am	C
	9:50 am	B
	10:00 am	D
	11:35 am	C
	11:45 am	B
	12:05 pm	D
	1:40 pm	C
	1:50 pm	B
	2:00 pm	D
	3:40 pm	C
	3:50 pm	F
Shift 3	4:00 pm	D
	5:40 pm	C
	5:50 pm	B
	6:00 pm	D
	7:40 pm	C
	7:50 pm	B
	8:05 pm	D
	9:40 pm	C
	9:50 pm	B
	10:00 pm	D
	11:40 pm	C
	11:50 pm	F

B—Break
C—Cycle all systems five times, visual inspection, driver's log entries
D—Drive bus as specified by procedure
F—Fuel bus, complete driver's log shift entries

"PLAN VIEW OF PENN STATE BUS TESTING AND RESEARCH FACILITY"



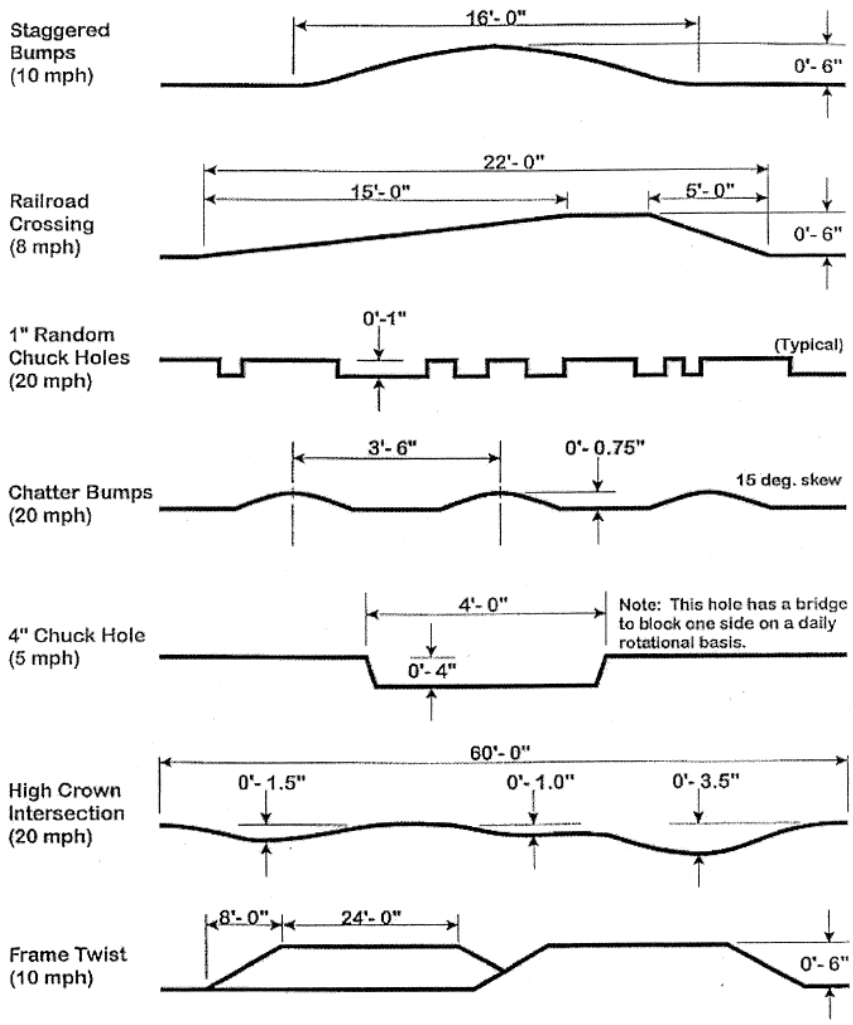
BUS TESTING AND RESEARCH TEST TRACK
UNIVERSITY PARK, PA



Plan View

Vehicle Durability Test Track

The Pennsylvania Transportation Institute
Penn State



Durability Element Profiles

The Pennsylvania Transportation Institute
Penn State

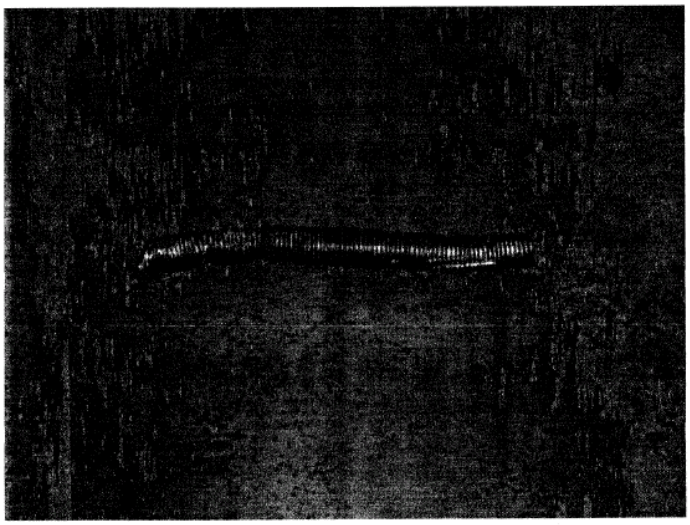
(Page 1 of 1)

UNSCHEDULED MAINTENANCE

Coach and Equipment 0514

DATE	TEST MILES	SERVICE	ACTIVITY	DOWN TIME	HOURS
09-15-05	1443	The transmission will not shift properly.	Warranty dealer replaced failed solenoid.	80.00	3.00
09-22-05	2381	All four rear spring bushings are worn.	Warranty dealer replaced all four rear spring bushings.	48.00	3.50
09-22-05	2381	Right rear spring, forward shackle; one rivet is broken and three are loose.	Broken and loose rivet removed and replaced with bolts.	6.00	1.00
09-30-05	2640	The center bolt in the left rear spring beam is broken.	Center bolt replaced in the left rear spring beam.	5.00	2.00
10-10-05	3159	The nut has come off the left rear spring eye-bolt.	Nut reinstalled and torqued.	16.00	0.50
10-20-05	5175	Coolant leak in the engine compartment—found the over flow pipe broken off at the radiator.	Radiator plugged and hose to surge tank capped.	4.00	0.50
10-25-05	5683	The center bolt in the right rear spring beam is broken.	Spring removed. Center bolt replaced and spring reinstalled.	4.00	1.50

UNSCHEDULED MAINTENANCE



FAILED LEFT REAR SPRING CENTER BOLT
(2,640 TEST MILES)

6. FUEL ECONOMY TEST - A FUEL CONSUMPTION TEST USING AN APPROPRIATE OPERATING CYCLE

6-I. TEST OBJECTIVE

The objective of this test is to provide accurate comparable fuel consumption data on transit buses produced by different manufacturers. This fuel economy test bears no relation to the calculations done by the Environmental Protection Agency (EPA) to determine levels for the Corporate Average Fuel Economy Program. EPA's calculations are based on tests conducted under laboratory conditions intended to simulate city and highway driving. This fuel economy test, as designated here, is a measurement of the fuel expended by a vehicle traveling a specified test loop under specified operating conditions. The results of this test will not represent actual mileage but will provide data that can be used by recipients to compare buses tested by this procedure.

6-II. TEST DESCRIPTION

This test requires operation of the bus over a course based on the Transit Coach Operating Duty Cycle (ADB Cycle) at seated load weight using a procedure based on the Fuel Economy Measurement Test (Engineering Type) For Trucks and Buses: SAE 1376 July 82. The procedure has been modified by elimination of the control vehicle and by modifications as described below. The inherent uncertainty and expense of utilizing a control vehicle over the operating life of the facility is impractical.

The fuel economy test will be performed as soon as possible (weather permitting) after the completion of the GVW portion of the structural durability test. It will be conducted on the bus test lane at the Penn State Test Facility. Signs are erected at carefully measured points which delineate the test course. A test run will comprise 3 CBD phases, 2 Arterial phases, and 1 Commuter phase. An electronic fuel measuring system will indicate the amount of fuel consumed during each phase of the test. The test runs will be repeated until there are at least two runs in both the clockwise and counterclockwise directions in which the fuel consumed for each run is within ± 4 percent of the average total fuel used over the 4 runs. A 20-minute idle consumption test is performed just prior to and immediately after the driven portion of the fuel economy test. The amount of fuel consumed while operating at normal/low idle is recorded on the Fuel Economy Data Form. This set of four valid runs along with idle consumption data comprise a valid test.

The test procedure is the ADB cycle with the following four modifications:

1. The ADB cycle is structured as a set number of miles in a fixed time in the following order: CBD, Arterial, CBD, Arterial, CBD, Commuter. A separate idle fuel consumption measurement is performed at the beginning and end of the fuel economy test. This phase sequence permits the reporting of fuel consumption for each of these phases separately, making the data more useful to bus manufacturers and transit properties.

2. The operating profile for testing purposes shall consist of simulated transit type service at seated load weight. The three test phases (figure 6-1) are: a central business district (CBD) phase of 2 miles with 7 stops per mile and a top speed of 20 mph; an arterial phase of 2 miles with 2 stops per mile and a top speed of 40 mph; and a commuter phase of 4 miles with 1 stop and a maximum speed of 40 mph. At each designated stop the bus will remain stationary for seven seconds. During this time, the passenger doors shall be opened and closed.

3. The individual ADB phases remain unaltered with the exception that 1 mile has been changed to 1 lap on the Penn State Test Track. One lap is equal to 5,042 feet. This change is accommodated by adjusting the cruise distance and time.

4. The acceleration profile, for practical purposes and to achieve better repeatability, has been changed to "full throttle acceleration to cruise speed".

Several changes were made to the Fuel Economy Measurement Test (Engineering Type) For Trucks and Buses: SAE 1376 July 82:

1. Sections 1.1, and 1.2 only apply to diesel, gasoline, methanol, and any other fuel in the liquid state (excluding cryogenic fuels).

1.1 SAE 1376 July 82 requires the use of at least a 16-gal fuel tank. Such a fuel tank when full would weigh approximately 160 lb. It is judged that a 12-gal tank weighing approximately 120 lb will be sufficient for this test and much easier for the technician and test personnel to handle.

1.2 SAE 1376 July 82 mentions the use of a mechanical scale or a flowmeter system. This test procedure uses a load cell readout combination that provides an accuracy of 0.5 percent in weight and permits on-board weighing of the gravimetric tanks at the end of each phase. This modification permits the determination of a fuel economy value for each phase as well as the overall cycle.

2. Section 2.1 applies to compressed natural gas (CNG), liquefied natural gas (LNG), cryogenic fuels, and other fuels in the vapor state.

2.1 A laminar type flowmeter will be used to determine the fuel consumption. The pressure and temperature across the flow element will be monitored by the flow computer. The flow computer will use this data to calculate the gas flow rate. The flow computer will also display the flow rate (scfm) as well as the total fuel used (scf). The total fuel used (scf) for each phase will be recorded on the Fuel Economy Data Form.

3. Use both Sections 1 and 2 for dual fuel systems.

FUEL ECONOMY CALCULATION PROCEDURE

A. For diesel, gasoline, methanol and fuels in the liquid state.

The reported fuel economy is based on the following: measured test quantities--distance traveled (miles) and fuel consumed (pounds); standard reference values--density of water at 60°F (8.3373 lbs/gal) and volumetric heating value of standard fuel; and test fuel specific gravity (unitless) and volumetric heating value (BTU/gal). These combine to give a fuel economy in miles per gallon (mpg) which is corrected to a standard gallon of fuel referenced to water at 60°F. This eliminates fluctuations in fuel economy due to fluctuations in fuel quality. This calculation has been programmed into a computer and the data processing is performed automatically.

The fuel economy correction consists of three steps:

1.) Divide the number of miles of the phase by the number of pounds of fuel consumed

phase	miles per phase	total miles per run
CBD	1.9097	5.7291
ART	1.9097	3.8193
COM	3.8193	3.8193

$$\mathbf{FEo_{mi/lb}} = \text{Observed fuel economy} = \frac{\text{miles}}{\text{lb of fuel}}$$

2.) Convert the observed fuel economy to miles per gallon [mpg] by multiplying by the specific gravity of the test fuel Gs (referred to water) at 60°F and multiply by the density of water at 60°F

$$\mathbf{FEo_{mpg}} = \mathbf{FEc_{mi/lb}} \times Gs \times Gw$$

where **Gs** = Specific gravity of test fuel at 60°F (referred to water)
Gw = 8.3373 lb/gal

3.) Correct to a standard gallon of fuel by dividing by the volumetric heating value of the test fuel (H) and multiplying by the volumetric heating value of standard reference fuel (Q). Both heating values must have the same units.

$$\mathbf{FEc} = \mathbf{FEo_{mpg}} \times \frac{Q}{H}$$

where

H = Volumetric heating value of test fuel [BTU/gal]
Q = Volumetric heating value of standard reference fuel

Combining steps 1-3 yields

$$\Longrightarrow \; FEc = \frac{\text{miles}}{\text{lbs}} \times (Gs \times Gw) \times \frac{Q}{H}$$

4.) Covert the fuel economy from mpg to an energy equivalent of miles per BTU. Since the number would be extremely small in magnitude, the energy equivalent will be represented as miles/BTUx10^6.

Eq = Energy equivalent of converting mpg to mile/BTUx10^6.

$$Eq = ((mpg)/(H))\times 10^6$$

B. CNG, LNG, cryogenic and other fuels in the vapor state.

The reported fuel economy is based on the following: measured test quantities--distance traveled (miles) and fuel consumed (scf); density of test fuel, and volumetric heating value (BTU/lb) of test fuel at standard conditions (P=14.73 psia and T=60 °F).

These combine to give a fuel economy in miles per lb. The energy equivalent (mile/BTUx10^6) will also be provided so that the results can be compared to buses that use other fuels.

1.) Divide the number of miles of the phase by the number of standard cubic feet (scf) of fuel consumed.

phase	miles per phase	total miles per run
CBD	1.9097	5.7291
ART	1.9097	3.8193
COM	3.8193	3.8193

$$\mathbf{FEo_{mi/scf}} = \text{Observed fuel economy} = \frac{\text{miles}}{\text{scf of fuel}}$$

2.) Convert the observed fuel economy to miles per lb by dividing FEo by the density of the test fuel at standard conditions (Lb/ft^3).

Note: The density of test fuel must be determined at standard conditions as described above. If the density is not defined at the above standard conditions, then a correction will be needed before the fuel economy can be calculated.

$$\mathbf{FEo_{mi/lb}} = FEo / Gm$$

where Gm = Density of test fuel at standard conditions

3.) Convert the observed fuel economy (FEomi/lb) to an energy equivalent of (miles/BTUx10^6) by dividing the observed fuel economy (FEomi/lb) by the heating value of the test fuel at standard conditions.

$$Eq = ((FEomi/lb)/H)x10^6$$

where

Eq = Energy equivalent of miles/lb to mile/BTUx10^6
H = Volumetric heating value of test fuel at standard conditions

6-III. DISCUSSION

This is a comparative test of fuel economy using diesel fuel with a heating value of 24,214.0 btu/lb. The driving cycle consists of Central Business District (CBD), Arterial (ART), and Commuter (COM) phases as described in 6-II. The fuel consumption for each driving cycle and for idle is measured separately. The results are corrected to a reference fuel with a volumetric heating value of 127,700.0 btu/gal.

An extensive pretest maintenance check is made including the replacement of all lubrication fluids. The details of the pretest maintenance are given in the first three Pretest Maintenance Forms. The fourth sheet shows the Pretest Inspection. The next sheet shows the correction calculation for the test fuel. The next four Fuel Economy Forms provide the data from the four test runs. Finally, the summary sheet provides the average fuel consumption. The overall average is based on total fuel and total mileage for each phase. The overall average fuel consumption values were; CBD – 6.84 mpg, ART – 7.12 mpg, and COM – 11.16 mpg. Average fuel consumption at idle was 5.55 lb/hr (0.89 gph).

FUEL ECONOMY PRE-TEST MAINTENANCE FORM

Bus Number: 0514	Date: 10-31-05	SLW (lbs): 13,410
Personnel: T.S. & S.C.		

FUEL SYSTEM	OK	Date	Initials
Install fuel measurement system	✔	10/31/05	S.C.
Replace fuel filter	✔	10/31/05	T.S.
Check for fuel leaks	✔	10/31/05	S.C.
Specify fuel type (refer to fuel analysis)	Diesel		
Remarks: None noted.			
BRAKES/TIRES	**OK**	**Date**	**Initials**
Inspect hoses	✔	10/31/05	S.C.
Inspect brakes	✔	10/31/05	S.C.
Relube wheel bearings	✔	10/31/05	T.S.
Check tire inflation pressures (mfg. specs.)	✔	10/31/05	S.C.
Remarks: None noted.			
COOLING SYSTEM	**OK**	**Date**	**Initials**
Check hoses and connections	✔	10/31/05	S.C.
Check system for coolant leaks	✔	10/31/05	S.C.
Remarks: None noted.			

FUEL ECONOMY PRE-TEST MAINTENANCE FORM (page 2)

Bus Number: 0514	Date: 10/31/05
Personnel: T.S. & S.C.	

ELECTRICAL SYSTEMS	OK	Date	Initials
Check battery	✔	10/31/05	S.C.
Inspect wiring	✔	10/31/05	S.C.
Inspect terminals	✔	10/31/05	S.C.
Check lighting	✔	10/31/05	S.C.
Remarks: None noted.			

DRIVE SYSTEM	OK	Date	Initials
Drain transmission fluid	✔	10/31/05	T.S.
Replace filter/gasket	✔	10/31/05	T.S.
Check hoses and connections	✔	10/31/05	T.S.
Replace transmission fluid	✔	10/31/05	T.S.
Check for fluid leaks	✔	10/31/05	T.S.
Remarks: None noted.			

LUBRICATION	OK	Date	Initials
Drain crankcase oil	✔	10/31/05	T.S.
Replace filters	✔	10/31/05	T.S.
Replace crankcase oil	✔	10/31/05	T.S.
Check for oil leaks	✔	10/31/05	T.S.
Check oil level	✔	10/31/05	T.S.
Lube all chassis grease fittings	✔	10/31/05	T.S.
Lube universal joints	✔	10/31/05	T.S.
Replace differential lube including axles	✔	10/31/05	T.S.
Remarks: None noted.			

FUEL ECONOMY PRE-TEST MAINTENANCE FORM (page 3)

Bus Number: 0514	Date: 10/31/05
Personnel: T.S. & S.C.	

EXHAUST/EMISSION SYSTEM	OK	Date	Initials
Check for exhaust leaks	✔	10/31/05	S.C.
Remarks: None noted.			

ENGINE	OK	Date	Initials
Replace air filter	✔	10/31/05	S.C.
Inspect air compressor and air system	N/A	10/31/05	S.C.
Inspect vacuum system, if applicable	✔	10/31/05	S.C.
Check and adjust all drive belts	✔	10/31/05	S.C.
Check cold start assist, if applicable	✔	10/31/05	S.C.
Remarks: None noted.			

STEERING SYSTEM	OK	Date	Initials
Check power steering hoses and connectors	✔	10/31/05	S.C.
Service fluid level	✔	10/31/05	S.C.
Check power steering operation	✔	10/31/05	S.C.
Remarks: None noted.			

	OK	Date	Initials
Ballast bus to seated load weight	✔	10/31/05	S.C.

TEST DRIVE	OK	Date	Initials
Check brake operation	✔	10/31/05	S.C.
Check transmission operation	✔	10/31/05	S.C.
Remarks: None noted.			

FUEL ECONOMY PRE-TEST INSPECTION FORM

Bus Number: 0514	Date: 11-1-05
Personnel: S.C.	

PRE WARM-UP	If OK, Initial
Fuel Economy Pre-Test Maintenance Form is complete	S.C.
Cold tire pressure (psi): Front 80 Middle N/A Rear 80	S.C.
Tire wear:	S.C.
Engine oil level	S.C.
Engine coolant level	S.C.
Interior and exterior lights on, evaporator fan on	S.C.
Fuel economy instrumentation installed and working properly.	S.C.
Fuel line -- no leaks or kinks	S.C.
Speed measuring system installed on bus. Speed indicator installed in front of bus and accessible to TECH and Driver.	S.C.
Bus is loaded to SLW	S.C.
WARM-UP	**If OK, Initial**
Bus driven for at least one hour warm-up	S.C.
No extensive or black smoke from exhaust	S.C.
POST WARM-UP	**If OK, Initial**
Warm tire pressure (psi): Front 82 Middle N/A Rear 83	S.C.
Environmental conditions Average wind speed <12 mph and maximum gusts <15 mph Ambient temperature between 30°F(-1C°) and 90°F(32°C) Track surface is dry Track is free of extraneous material and clear of interfering traffic	S.C.

FUEL ECONOMY DATA FORM (Liquid Fuels)

Bus Number: 0514	Manufacturer: Coach & Equipment	Date: 11/1/05
Run Number: 1	Personnel: T.S., B.S. & S.C.	
Test Direction: □CW or ■CCW	Temperature (°F): 63	Humidity (%): 42
SLW (lbs): 13,410	Wind Speed (mph) & Direction: 10/SSW	Barometric Pressure (in.Hg): 29.97

Cycle Type	Time (min:sec)		Cycle Time (min:sec)	Fuel Temperature (°C)	Load Cell Reading (lb)		Fuel Used (lbs)
	Start	Finish		Start	Start	Finish	
CBD #1	0	8:53	8:53	20.5	0	1.75	1.75
ART #1	0	4:01	4:01	21.0	0	1.74	1.74
CBD #2	0	8:45	8:45	21.0	0	1.78	1.78
ART #2	0	3:54	3:54	23.0	0	1.78	1.78
CBD #3	0	8:30	8:30	27.5	0	1.80	1.80
COMMUTER	0	6:04	6:04	27.5	0	2.20	2.20
							Total Fuel = 11.05 lbs

20 minute idle : Total Fuel Used = 1.88 lbs

Heating Value = 20,214.0 BTU/LB

Comments: None

FUEL ECONOMY DATA FORM (Liquid Fuels)

Bus Number: 0514	Manufacturer: Coach & Equipment	Date: 11-1-05
Run Number: 2	Personnel: T.S., B.S. & S.C.	
Test Direction: ■CW or □CCW	Temperature (°F): 64	Humidity (%): 42
SLW (lbs): 13,410	Wind Speed (mph) & Direction: 10/SSW	Barometric Pressure (in.Hg): 29.97

Cycle Type	Time (min:sec)		Cycle Time (min:sec)	Fuel Temperature (°C)	Load Cell Reading (lb)		Fuel Used (lbs)
	Start	Finish		Start	Start	Finish	
CBD #1	0	8:42	8:42	30.0	0	1.73	1.73
ART #1	0	3:57	3:57	30.0	0	1.65	1.65
CBD #2	0	8:30	8:30	30.0	0	1.73	1.73
ART #2	0	3:56	3:56	29.5	0	1.68	1.68
CBD #3	0	8:44	8:44	31.0	0	1.78	1.78
COMMUTER	0	6:02	6:02	31.5	0	2.12	2.12
							Total Fuel = 10.69 lbs

20 minute idle : Total Fuel Used = N/A lbs

Heating Value = 20,214.0 BTU/LB

Comments: None

FUEL ECONOMY DATA FORM (Liquid Fuels)

Bus Number: 0514	Manufacturer: Coach & Equipment	Date: 11-1-05
Run Number: 3	Personnel: T.S., B.S. & S.C.	
Test Direction: □CW or ■CCW	Temperature (°F): 64	Humidity (%): 42
SLW (lbs): 13,410	Wind Speed (mph) & Direction: 10/SSW	Barometric Pressure (in.Hg): 29.91

Cycle Type	Time (min:sec)		Cycle Time (min:sec)	Fuel Temperature (°C)	Load Cell Reading (lb)		Fuel Used (lbs)
	Start	Finish		Start	Start	Finish	
CBD #1	0	8:28	8:28	30.5	0	1.81	1.81
ART #1	0	3:56	3:56	32.0	0	1.68	1.68
CBD #2	0	8:26	8:26	32.0	0	1.75	1.75
ART #2	0	4:04	4:04	32.5	0	1.68	1.68
CBD #3	0	8:25	8:25	32.5	0	1.79	1.79
COMMUTER	0	6:08	6:08	33.0	0	2.19	2.19
							Total Fuel = 10.90 lbs

20 minute idle : Total Fuel Used = N/A lbs

Heating Value = 20,214.0 BTU/LB

Comments: None

FUEL ECONOMY DATA FORM (Liquid Fuels)

Bus Number: 0514	Manufacturer: Coach & Equipment	Date: 11-1-05
Run Number: 4	Personnel: T.S., B.S. & S.C.	
Test Direction: ■CW or □CCW	Temperature (°F): 65	Humidity (%): 42
SLW (lbs): 13,410	Wind Speed (mph) & Direction: 10/SSW	Barometric Pressure (in.Hg): 29.91

Cycle Type	Time (min:sec)		Cycle Time (min:sec)	Fuel Temperature (°C)	Load Cell Reading (lb)		Fuel Used (lbs)
	Start	Finish		Start	Start	Finish	
CBD #1	0	8:24	8:24	30.5	0	1.71	1.71
ART #1	0	4:01	4:01	32.0	0	1.63	1.63
CBD #2	0	8:23	8:23	32.0	0	1.75	1.75
ART #2	0	4:03	4:03	32.5	0	1.63	1.63
CBD #3	0	8:25	8:25	32.5	0	1.64	1.64
COMMUTER	0	6:20	6:20	33.0	0	2.08	2.08
							Total Fuel = 10.44 lbs

20 minute idle : Total Fuel Used = 1.82 lbs

Heating Value = 20,214.0 BTU/LB

Comments: None

0514.FUL
FUEL ECONOMY SUMMARY SHEET

BUS MANUFACTURER :Coach & Equipment
BUS MODEL :Phoenix

BUS NUMBER :0514
TEST DATE :11/1/05

FUEL TYPE : DIESEL
SP. GRAVITY : .8095
HEATING VALUE : 20214.00 BTU/Lb
Standard Conditions : 60 deg F and 14.7 psi
Density of Water : 8.3373 lb/gallon at 60 deg F

CYCLE	TOTAL FUEL USED (Lb)	TOTAL MILES	FUEL ECONOMY M/Lb(Measured)	FUEL ECONOMY MPG(Corrected)
Run # :1, CCW				
CBD	5.33	5.73	1.08	6.74
ART	3.52	3.82	1.09	6.80
COM	2.20	3.82	1.74	10.88
TOTAL	11.05	13.37	1.21	7.58
Run # :2, CW				
CBD	5.24	5.73	1.09	6.85
ART	3.33	3.82	1.15	7.19
COM	2.12	3.82	1.80	11.29
TOTAL	10.69	13.37	1.25	7.84
Run # :3, CCW				
CBD	5.35	5.73	1.07	6.71
ART	3.36	3.82	1.14	7.13
COM	2.19	3.82	1.74	10.93
TOTAL	10.90	13.37	1.23	7.69
Run # :4, CW				
CBD	5.10	5.73	1.12	7.04
ART	3.26	3.82	1.17	7.34
COM	2.08	3.82	1.84	11.51
TOTAL	10.44	13.37	1.28	8.03

IDLE CONSUMPTION

First 20 Minutes Data : 1.88 Lb Last 20 Minutes Data : 1.82 Lb
Average Idle Consumption : 5.55 Lb/Hr

RUN CONSISTENCY: % Difference from overall average of total fuel used

Run 1 : -2.6 Run 2 : .7 Run 3 : -1.2 Run 4 : 3.1

SUMMARY

Average Idle Consumption : .89 G/Hr
Average CBD Phase Consumption : 6.84 MPG
Average Arterial Phase Consumption : 7.12 MPG
Average Commuter Phase Consumption : 11.16 MPG
Overall Average Fuel Consumption : 7.78 MPG
Overall Average Fuel Consumption : 57.06 Miles/ Million BTU

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7. NOISE

7.1 INTERIOR NOISE AND VIBRATION TESTS

7.1-I. TEST OBJECTIVE

The objective of these tests is to measure and record interior noise levels and check for audible vibration under various operating conditions.

7.1-II. TEST DESCRIPTION

During this series of tests, the interior noise level will be measured at several locations with the bus operating under the following three conditions:

1. With the bus stationary, a white noise generating system shall provide a uniform sound pressure level equal to 80 dB(A) on the left, exterior side of the bus. The engine and all accessories will be switched off and all openings including doors and windows will be closed. This test will be performed at the ABTC.

2. The bus accelerating at full throttle from a standing start to 35 mph on a level pavement. All openings will be closed and all accessories will be operating during the test. This test will be performed on the track at the Test Track Facility.

3. The bus will be operated at various speeds from 0 to 55 mph with and without the air conditioning and accessories on. Any audible vibration or rattles will be noted. This test will be performed on the test segment between the Test Track and the Bus Testing Center.

All tests will be performed in an area free from extraneous sound-making sources or reflecting surfaces. The ambient sound level as well as the surrounding weather conditions will be recorded in the test data.

7.1-III. DISCUSSION

This test is performed in three parts. The first part exposes the exterior of the vehicle to 80.0 dB(A) on the left side of the bus and the noise transmitted to the interior is measured. The overall average of the six measurements was 52.7 dB(A); ranging from 51.2 dB(A) at the driver's seat to 53.5 dB(A) in line with the middle speaker. The interior ambient noise level for this test was 34.0 dB(A).

The second test measures interior noise during acceleration from 0 to 35 mph. This noise level ranged from 67.7 dB(A) at the rear passenger seats to 74.5 dB(A) at the driver's seat. The overall average was 70.1 dB(A). The interior ambient noise level for this test was 36.2 dB(A).

The third part of the test is to listen for resonant vibrations, rattles, and other noise sources while operating over the road. No vibrations or rattles were noted.

INTERIOR NOISE TEST DATA FORM
Test Condition 1: 80 dB(A) Stationary White Noise

Bus Number: 0514	Date: 8-22-05
Personnel: S.C. & T.S.	
Temperature (°F): 65	Humidity (%): 55
Wind Speed (mph): Calm	Wind Direction: Calm
Barometric Pressure (in.Hg): 30.11	
Initial Sound Level Meter Calibration: ■ checked by: S.C.	
Interior Ambient Noise Level dB(A): 34.0	Exterior Ambient Noise Level dB(A): 44.9
Microphone Height During Testing (in): 48.0	

Measurement Location	Measured Sound Level dB(A)
Driver's Seat	51.2
Front Passenger Seats	52.7
In Line with Front Speaker	53.3
In Line with Middle Speaker	53.5
In Line with Rear Speaker	53.1
Rear Passenger Seats	52.5

Final Sound Level Meter Calibration: ■ checked by: S.C.

Comments: All readings taken in the center aisle.

INTERIOR NOISE TEST DATA FORM
Test Condition 2: 0 to 35 mph Acceleration Test

Bus Number: 0514	Date: 11-2-05
Personnel: S.C., B.C. & G.M.	
Temperature (°F): 46	Humidity (%): 56
Wind Speed (mph): 5	Wind Direction: SW
Barometric Pressure (in.Hg): 30.09	
Initial Sound Level Meter Calibration: ■ checked by: S.C.	
Interior Ambient Noise Level dB(A): 36.2	Exterior Ambient Noise Level dB(A): 39.0
Microphone Height During Testing (in): 48.0	

Measurement Location	Measured Sound Level dB(A)
Driver's Seat	74.5
Front Passenger Seats	70.1
Middle Passenger Seats	68.0
Rear Passenger Seats	67.7

Final Sound Level Meter Calibration: ■ checked by: S.C.

Comments: All readings taken in the center aisle.

INTERIOR NOISE TEST DATA FORM
Test Condition 3: Audible Vibration Test

Bus Number: 0514	Date: 11-2-05
Personnel: S.C.	
Temperature (°F): 46	Humidity (%): 56
Wind Speed (mph): 5	Wind Direction: SW
Barometric Pressure (in.Hg): 30.09	

Describe the following possible sources of noise and give the relative location on the bus.

Source of Noise	Location
Engine and Accessories	None noted.
Windows and Doors	None noted.
Seats and Wheel Chair lifts	None noted.

Comment on any other vibration or noise source which may have occurred
that is not described above: None noted.

7.1 INTERIOR NOISE TEST

TEST BUS SET-UP FOR 80 dB(A)
INTERIOR NOISE TEST

7.2 EXTERIOR NOISE TESTS

7.2-I. TEST OBJECTIVE

The objective of this test is to record exterior noise levels when a bus is operated under various conditions.

7.2-II. TEST DESCRIPTION

In the exterior noise tests, the bus will be operated at a SLW in three different conditions using a smooth, straight and level roadway:

1. Accelerating at full throttle from a constant speed at or below 35 mph and just prior to transmission up shift.
2. Accelerating at full throttle from standstill.
3. Stationary, with the engine at low idle, high idle, and wide open throttle.

In addition, the buses will be tested with and without the air conditioning and all accessories operating. The exterior noise levels will be recorded.

The test site is at the PSBRTF and the test procedures will be in accordance with SAE Standards SAE J366b, Exterior Sound Level for Heavy Trucks and Buses. The test site is an open space free of large reflecting surfaces. A noise meter placed at a specified location outside the bus will measure the noise level.

During the test, special attention should be paid to:

1. The test site characteristics regarding parked vehicles, signboards, buildings, or other sound-reflecting surfaces
2. Proper usage of all test equipment including set-up and calibration
3. The ambient sound level

7.2-III. DISCUSSION

The Exterior Noise Test determines the noise level generated by the vehicle under different driving conditions and at stationary low and high idle, with and without air conditioning and accessories operating. The test site is a large, level, bituminous paved area with no reflecting surfaces nearby.

With an exterior ambient noise level of 39.5 dB(A), the average test result obtained while accelerating from a constant speed was 73.9 dB(A) on the right side and 75.1 dB(A) on the left side.

When accelerating from a standstill with an exterior ambient noise level of 39.0 dB(A), the average of the results obtained were 73.0 dB(A) on the right side and 74.6 dB(A) on the left side.

With the vehicle stationary and the engine, accessories, and air conditioning on, the measurements averaged 59.6 dB(A) at low idle, 64.8 dB(A) at high idle, and 74.6 dB(A) at wide open throttle. With the accessories and air conditioning off, the readings averaged 1.0 dB(A) lower at low idle, 4.4 dB(A) lower at high idle, and 1.6 dB(A) lower at wide open throttle. The exterior ambient noise level measured during this test was 39.7 dB(A).

EXTERIOR NOISE TEST DATA FORM
Accelerating from Constant Speed

Bus Number: 0514	Date: 11-2-05
Personnel: B.S. & S.C.	
Temperature (°F): 52	Humidity (%): 51
Wind Speed (mph): 5 to 8	Wind Direction: SW
Barometric Pressure (in.Hg): 30.10	
Verify that microphone height is 4 feet, wind speed is less than 12 mph and ambient temperature is between 30°F and 90°F: ■ checked by: S.C.	
Initial Sound Level Meter Calibration: ■ checked by: S.C.	
Exterior Ambient Noise Level dB(A): 39.5	

Accelerating from Constant Speed Curb (Right) Side		Accelerating from Constant Speed Street (Left) Side	
Run #	Measured Noise Level dB(A)	Run #	Measured Noise Level dB(A)
1	73.5	1	74.4
2	74.3	2	74.8
3	73.4	3	74.6
4	73.4	4	75.0
5	73.4	5	75.1
Average of two highest actual noise levels = 73.9 dB(A)		Average of two highest actual noise levels = 75.1 dB(A)	
Final Sound Level Meter Calibration Check: ■ checked by: S.C.			
Comments: None noted.			

EXTERIOR NOISE TEST DATA FORM
Accelerating from Standstill

Bus Number: 0514	Date: 11-2-05
Personnel: B.S. & S.C.	
Temperature (°F): 53	Humidity (%): 51
Wind Speed (mph): 5 to 8	Wind Direction: SW
Barometric Pressure (in.Hg): 30.10	
Verify that microphone height is 4 feet, wind speed is less than 12 mph and ambient temperature is between 30°F and 90°F: ■ checked by: S.C.	
Initial Sound Level Meter Calibration: ■ checked by: S.C.	
Exterior Ambient Noise Level dB(A): 39.0	

Accelerating from Standstill Curb (Right) Side		Accelerating from Standstill Street (Left) Side	
Run #	Measured Noise Level dB(A)	Run #	Measured Noise Level dB(A)
1	73.0	1	73.6
2	73.0	2	74.3
3	72.5	3	74.5
4	72.6	4	74.7
5	72.5	5	73.9
Average of two highest actual noise levels = 73.0 dB(A)		Average of two highest actual noise levels = 74.6 dB(A)	

Final Sound Level Meter Calibration Check: ■ checked by: S.C.
Comments: None noted.

EXTERIOR NOISE TEST DATA FORM
Stationary

Bus Number: 0514	Date: 11-2-05
Personnel: B.S., S.C. & G.M.	
Temperature (°F): 53	Humidity (%): 51
Wind Speed (mph): 5 to 8	Wind Direction: SW
Barometric Pressure (in.Hg): 30.10	
Verify that microphone height is 4 feet, wind speed is less than 12 mph and ambient temperature is between 30°F and 90°F: ■ checked by: S.C.	
Initial Sound Level Meter Calibration: ■ checked by: S.C.	
Exterior Ambient Noise Level dB(A): 39.7	

Accessories and Air Conditioning ON			
Throttle Position	Engine RPM	Curb (Right) Side dB(A)	Street (Left) Side db(A)
		Measured	Measured
Low Idle	700	59.4	59.7
High Idle	1,200	64.1	65.5
Wide Open Throttle	4,000	74.8	74.3

Accessories and Air Conditioning OFF			
Throttle Position	Engine RPM	Curb (Right) Side dB(A)	Street (Left) Side db(A)
		Measured	Measured
Low Idle	750	59.1	58.1
High Idle	1,250	60.6	60.2
Wide Open Throttle	4,000	74.3	71.3

Final Sound Level Meter Calibration Check: ■ checked by: S.C.
Comments: None noted.